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MARCH 30, 1944

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Quick Check up ON CMP THINSTEEL

The IRON AGE

VERSATILE ✓
Hundreds of applications such as liquid filters, springs, eyelets, razor blades, radio tube parts.

ADAPTABLE ✓
Wide range of physical properties to meet specific service requirements where steel formerly thought not feasible.

UNUSUAL ✓
Precision cold rolled in gauges thin as .001 — closest tolerances assures maximum feet per pound.

PRACTICAL ✓
Widths up to 24 inches and coils up to 300 lbs. per inch of width reduce delays on automatic equipment.

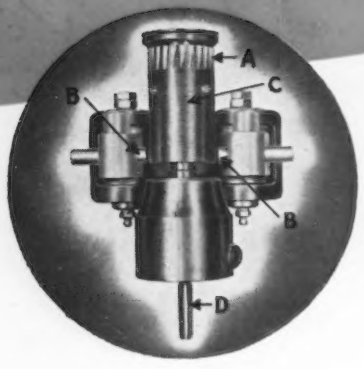
ECONOMICAL ✓
Minimum of production problems in forming or stamping operations. Reasonable cost of steel itself.

THE COLD METAL PRODUCTS CO.
Subsidiary of the Cold Metal Process Company
YOUNGSTOWN 1, OHIO

CMP PRECISION COLD ROLLED STRIP STEEL

GIVES MAXIMUM PRODUCTION PER TON

Get Extreme Thread Accuracy Reduce Rejects –Save Material Eliminate Tap Breakage



THE SECRET LIES IN THE NEW LEAD SCREW PRINCIPLE

THREADING or tapping is often the last operation on an accurately machined part. Inaccuracy of thread can mean rejects with the scrapping of critical materials and the loss of all the costly precision operations which have gone before.

The Warner & Swasey Precision Tapping and Threading Machine introduces a new principle to insure extreme accuracy in cutting internal and external threads—a patented combination of lead screw and electrically actuated guide fingers. The upper portion of the lead screw (A) is a hob which cuts mating threads into the brass guide fingers (B) to match the pitch of the lead screw (C) and the tap (D). Solenoid action engages the guide fingers and lead screw to maintain precision lead during the tap travel. This patented mechanism compensates for wear of guide fingers against lead screws and eliminates lead errors and backlash.

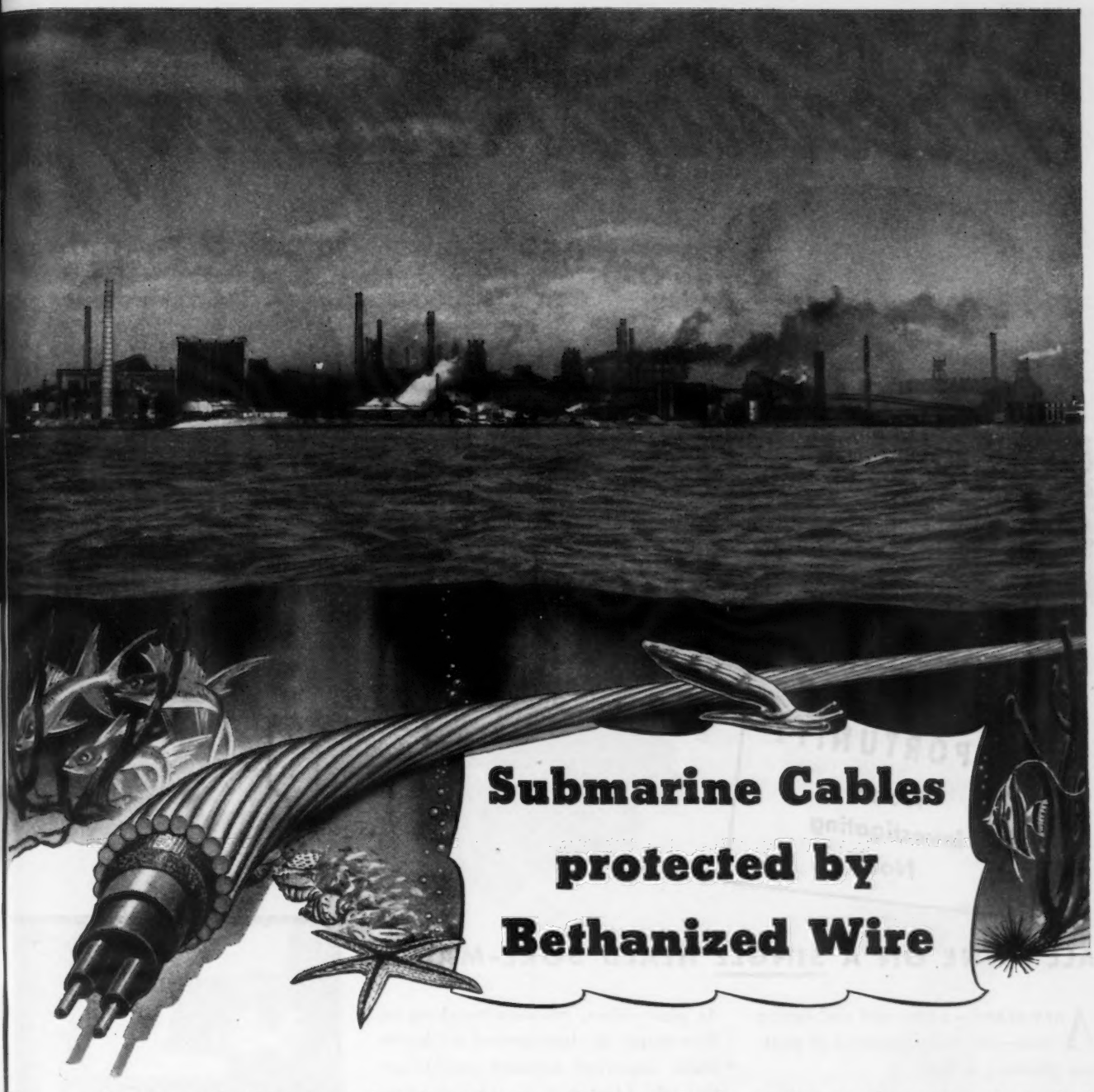
On these Warner & Swasey machines, operators —men and women with average training—can cut class 3, 4 and even 5 gage fits in hard and soft materials. Numerous case histories tell of production going up while scrap loss and tap breakage go down.

A catalog describing four models of the Warner & Swasey Precision Tapping and Threading Machines for large and small work capacities from 0-80 to 1½", free on request. Ask your Warner & Swasey representative or write

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS... WITH A WARNER & SWASEY

WARNER & SWASEY Cleveland

TURRET LATHES, SADDLE AND RAM TYPES • CHUCKING AND BAR TOOLS • PRECISION TAPPING AND THREADING MACHINES



Submarine Cables protected by Bethanized Wire

Many are the war production plants that depend on submarine cables to bring them power to keep in high gear. Submarine cables, laid across river-beds and on harbor- and lake-bottoms, are furnishing electrical energy to factories hard at work for the armed forces in many sections of America.

The power-conducting copper wires at the center of a submarine cable are protected by layers of insulating compounds, jute and lead sheathing. The tough long-pitch outer coating is made of steel wire. Supplying corrosion-resisting bethanized wire for armoring cables is one of the many war jobs of Bethlehem's wire mills.

By the bethanizing process a coating of 99.9+ per cent pure zinc is applied to the steel base by an advanced electrolytic method. Bethanized wire has maximum resistance to corrosion as a result of the high purity of the bethanized coating, and its uniformity both around and along the wire. Because the zinc is fastened to the wire atom by atom, there can be no thin spots in the coating to give rust a start. And bethanized wire is so highly ductile that it can be bent and twisted—even drawn through dies to very fine gage—without harming the coating in any way.

Bethanized wire is engaged in many other war jobs—from the making of zippers for fliers' jackets to providing extra strength for field telephone lines. Post-war uses of bethanized wire may far exceed all previous ideas as to possible uses of zinc-coated wire.

★ ★ ★ BETHLEHEM STEEL ★ ★ ★

BETHLEHEM STEEL COMPANY, Bethlehem, Pa.
Bethlehem Steel Export Corporation New York City

THE IRON AGE, published every Thursday by the CHILTON CO. (INC.). Entered as second class matter November 8, 1932, at the Post Office at Philadelphia under act of March 3, 1879. $8 yearly in North America and South America, Foreign $15. Vol. 153, No. 13.

Precision Roughing

A POST-WAR OPPORTUNITY
Worth Investigating Now!

ALL DONE ON A SINGLE HEALD BORE-MATIC!

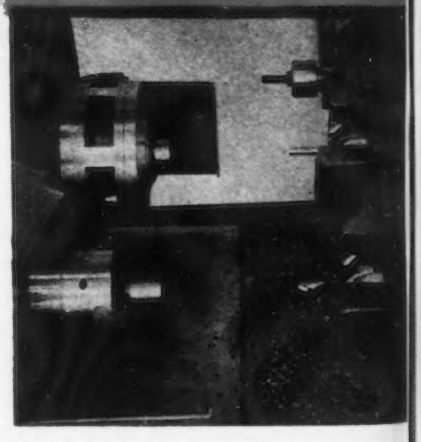
A NEW SLANT—a time and cost-saving one—for those engaged in post-war planning is this . . .

perform secondary operations, plus final finishing, on one machine . . . The Heald Bore-matic.

Because it is a precision machine with vibrationless operation inherent in its design, use of the Bore-matic for roughing as well as finishing operations on many types of work is entirely practical. Many times, one cut, from either forging or casting, will do the job successfully.

As plus values, precision roughing on Bore-matics is characterized by better finish, improved accuracy and longer tool life. Ideal surfaces, too, are produced—both with respect to alignment and stock distribution—for final finishing also done on Heald Bore-matics.

To plan your better post-war products; to lower costs; to keep a jump ahead of competition; to get dual use from each machine . . . get in touch with Precision Headquarters, where "thinking it out, pays out." The Heald Machine Co., Worcester, Mass.



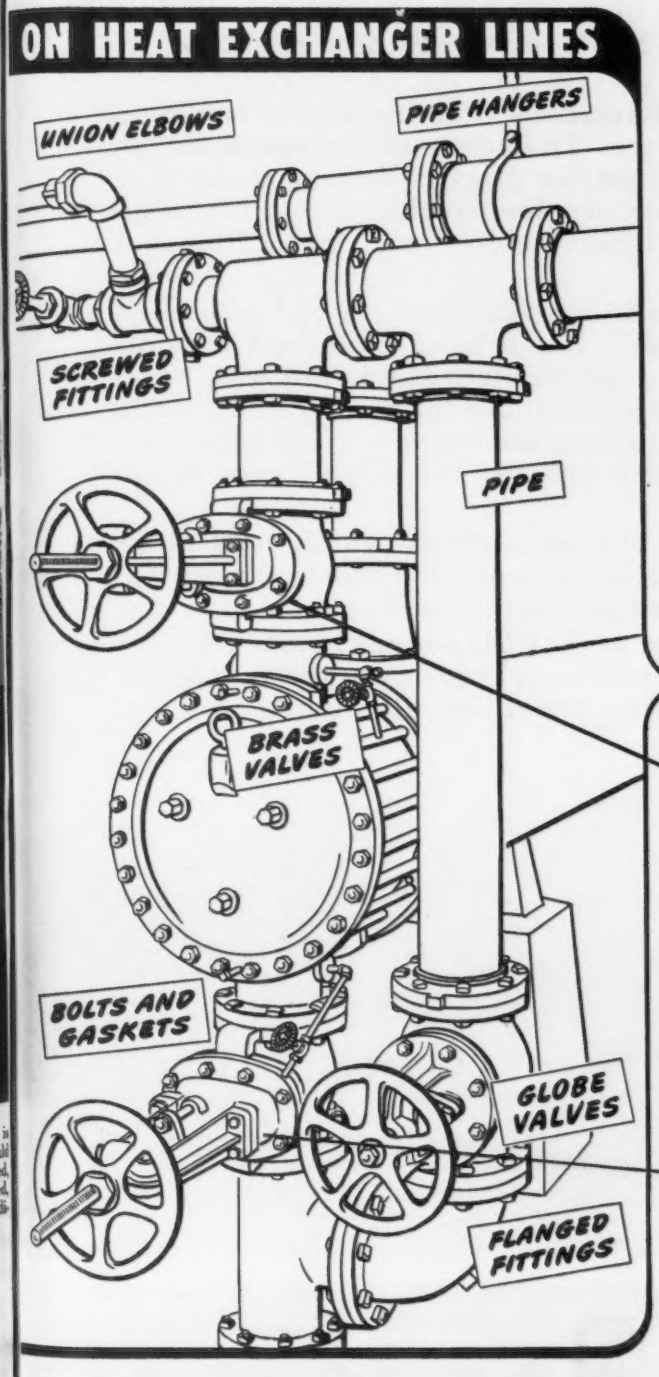
This automotive gear, except for cutting teeth, is completely finished from the rough on the Heald Bore-matic. Gears are rough and finish turned, drilled and finish bored, rough and finish faced, and chamfered on both outside and inside diameters, with good accuracy and finish.

HEALD *for more Precision . . . Faster!*

Internal and Surface Grinding Machines • Bore-matic Precision Finishing Machines

Everything for Pipe Lines - - you can get it from Crane

One high standard of quality throughout . . . One source of supply . . . One responsibility for all materials

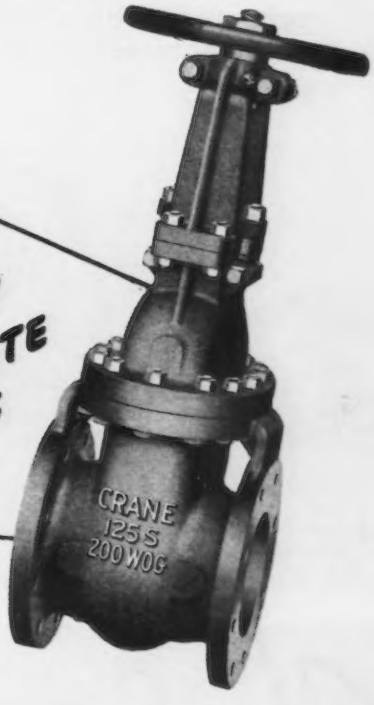


FOR these advantages you can thank the unusual completeness of the Crane line of piping materials, shown by the installation at left. Every part, from pipe and pipe hangers to valves and fittings, comes from Crane. And from end to end, the performance of every part is assured by Crane superior quality.

Take a look at Crane quality through the iron body wedge gate valves in this hook-up. The body is strengthened to resist line strains. Port openings are straight through, giving streamline flow. A deeper stuffing box lengthens packing life. The stem has adequate power for positive seating, and extra long guides keep disc travel true.

With such refinements marking every item in the world's largest line of piping equipment, Crane is your magic word for better fluid handling service whether you need a single pipe fitting or an entire system. Crane Co.'s 89-year leadership in its field sees to that.

CRANE CO., General Offices: 836 S. Michigan Ave. Chicago 5, Illinois.



CRANE

VALVES • FITTINGS • PIPE
PLUMBING • HEATING • PUMPS

INSERT MOLDING

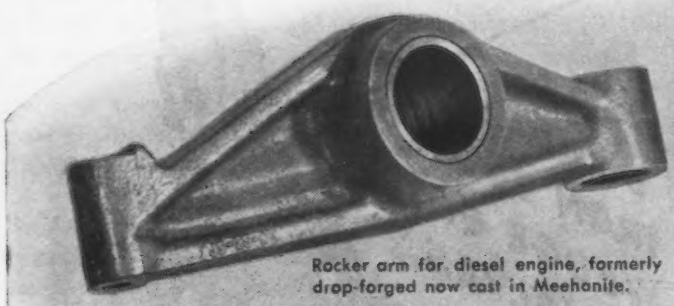
THE use of steel inserts in the molding of high-duty irons provides many opportunities for designing engineers to combine the best properties of iron and steel, to conceal necessary but unsightly piping within the casting itself, and to achieve both these results at reduced manufacturing cost.

Insert molding is difficult and often hazardous. For this reason few foundries have endeavored to extend its use. The nature of Cooper-Bessemer designs inspired our foundries to adopt the practice twenty years ago. Now, after two decades of experience, we feel qualified to give engineering advice on the application of insert molding, and invite inquiries for castings involving its use.

In the two illustrations given here insert molding made a net reduction in machining cost of 13.2% and 14.6%. Much more important for cost reduction, of course, was the use of a high-strength Meehanite casting in place of a forging. In the case of the crankshaft, formerly made from a block forging in small lots of six and twelve, the use of a Meehanite casting instead of a block forging actually reduced the overall cost of the crankshaft by more than 50%.

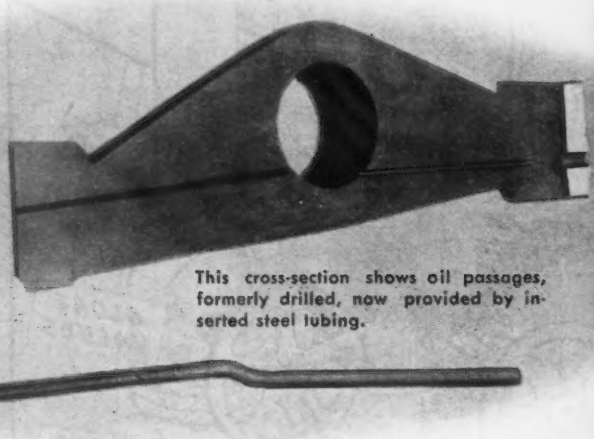
If you are using forgings, weldments, or steel castings which require intricate drilling, boring and machining operations, investigate the advantages of Cooper-Bessemer's engineered Meehanite castings.

Our foundries can produce castings up to 80,000 pounds in size. We are prepared to handle certain repetitive casting jobs for a limited number of manufacturers. Your inquiry will receive immediate attention.



Rocker arm for diesel engine, formerly drop-forged now cast in Meehanite.

By casting the rocker arm of Meehanite and including this short length of shaped steel tubing for oil passages, machining time was reduced 13.2%.



This cross-section shows oil passages, formerly drilled, now provided by inserted steel tubing.

The Cooper-Bessemer CORPORATION

may cut your costs too!

Diesel engine water pump crankshaft, formerly block forged, now cast in Meehanite.

This longitudinal section shows oil passages of steel tubing. The inclusion of this tubing in the mold eliminated 14.6% of former machining time.

Steel tubing used for oil passages, ready to be inserted in mold. This practice also permits passages to come out on the side or neutral axis of crankpins and journals, relieving stress concentration.

Meehanite Foundries

MT. VERNON, OHIO, DEPT. C, GROVE CITY, PENNA. DEPT. F,

Both on

BALDWIN SERVES THE NATION WHICH THE RAILROADS HELPED TO BUILD

...these are BALDWINS

BALDWIN-WESTINGHOUSE DIESEL ELECTRIC LOCOMOTIVE

These units have a century of locomotive building experience behind them.

The *Laboratory* knows Baldwin as makers of the finest, most precise laboratory *testing machines*. The mill knows Baldwin as the builders of tough, powerful diesel electric *locomotives* that take terrific punishment, and still keep rolling.

They're both right . . . but this still doesn't tell the complete story. Baldwin supplies [illegible] other important equipment and material items to the metals field.

Next time you're specifying or ordering remember that the quality and performance of any Baldwin product you *know* is an accurate index to what you can expect in any Baldwin product with that name. The Baldwin Locomotive Works, Philadelphia, Pennsylvania, U. S. A.

BALDWIN PRODUCTS

Hydraulic presses, Testing equipment, Steel castings and forgings, Diesel electric locomotives, Diesel engines, Metal cutting and metal forming machine tools, Electric motors, Electric locomotives, Processing machinery, Bronze castings, Steel castings, Malleable castings, Pressure castings, Piston rings, Piston rods, Piston heads, Piston rod packing, Piston rod packing rings, Piston rod packing glands, Piston rod packing boxes, Piston rod packing retainers, Piston rod packing springs, Piston rod packing segments, Piston rod packing expanders, Piston rod packing wedges, Piston rod packing keys, Piston rod packing pins, Piston rod packing bolts, Piston rod packing nuts, Piston rod packing washers, Piston rod packing cotters, Piston rod packing lock nuts, Piston rod packing lock washers, Piston rod packing lock pins, Piston rod packing lock bolts, Piston rod packing lock keys, Piston rod packing lock cotters, Piston rod packing lock springs, Piston rod packing lock segments, Piston rod packing lock expanders, Piston rod packing lock wedges, Piston rod packing lock retainers, Piston rod packing lock boxes, Piston rod packing lock glands, Piston rod packing lock rings, Piston rod packing lock heads, Piston rod packing lock rods, Piston rod packing lock castings, Piston rod packing lock forgings, Piston rod packing lock machine tools, Piston rod packing lock engines, Piston rod packing lock motors, Piston rod packing lock locomotives, Piston rod packing lock processing machinery, Piston rod packing lock bronze castings, Piston rod packing lock steel castings, Piston rod packing lock malleable castings, Piston rod packing lock pressure castings, Piston rod packing lock piston rings, Piston rod packing lock piston rods, Piston rod packing lock piston heads, Piston rod packing lock piston rod packing, Piston rod packing lock piston rod packing rings, Piston rod packing lock piston rod packing glands, Piston rod packing lock piston rod packing boxes, Piston rod packing lock piston rod packing retainers, Piston rod packing lock piston rod packing springs, Piston rod packing lock piston rod packing segments, Piston rod packing lock piston rod packing expanders, Piston rod packing lock piston rod packing wedges, Piston rod packing lock piston rod packing keys, Piston rod packing lock piston rod packing pins, Piston rod packing lock piston rod packing bolts, Piston rod packing lock piston rod packing nuts, Piston rod packing lock piston rod packing washers, Piston rod packing lock piston rod packing cotters, Piston rod packing lock piston rod packing lock nuts, Piston rod packing lock piston rod packing lock washers, Piston rod packing lock piston rod packing lock pins, Piston rod packing lock piston rod packing lock bolts, Piston rod packing lock piston rod packing lock keys, Piston rod packing lock piston rod packing lock cotters, Piston rod packing lock piston rod packing lock springs, Piston rod packing lock piston rod packing lock segments, Piston rod packing lock piston rod packing lock expanders, Piston rod packing lock piston rod packing lock wedges, Piston rod packing lock piston rod packing lock retainers, Piston rod packing lock piston rod packing lock boxes, Piston rod packing lock piston rod packing lock glands, Piston rod packing lock piston rod packing lock rings, Piston rod packing lock piston rod packing lock heads, Piston rod packing lock piston rod packing lock rods, Piston rod packing lock piston rod packing lock castings, Piston rod packing lock piston rod packing lock forgings, Piston rod packing lock piston rod packing lock machine tools, Piston rod packing lock piston rod packing lock engines, Piston rod packing lock piston rod packing lock motors, Piston rod packing lock piston rod packing lock locomotives, Piston rod packing lock piston rod packing lock processing machinery, Piston rod packing lock piston rod packing lock bronze castings, Piston rod packing lock piston rod packing lock steel castings, Piston rod packing lock piston rod packing lock malleable castings, Piston rod packing lock piston rod packing lock pressure castings.

BLW
THE BALDWIN GROUP

LOCALIZED ANNEALING COST

REDUCED 50%

with a G-E Electronic Heater

The thumbscrews are so positioned on the conveyor belt by the operator that only the tip is heated. Only a ten-second treatment is required.

JUST the 1/8-inch tip of these small thumbscrews—part of a hose-clamp assembly for airplanes, tanks, and other war equipment—must be annealed. The rest of the screw must remain hardened right out to the end of the threads.

By conventional heating methods it was difficult to confine the heat properly—and cost was excessive.

Now, with a single G-E electronic heater, the Wittek Manufacturing Company, Chicago, Ill., (a leading manufacturer of aviation hose clamps) anneals *100,000 thumbscrews a day—at one-half the former cost—and with absolute uniformity of results!*

A simple conveyor belt automatically positions the thumbscrews so that *only the tip* passes through the coil of the heater. Thus, the heat is concentrated on this one small section, and the rest of the screw is not affected.

That is a typical example of precision heat-treating being done today by inductive heating with G-E electronic heaters. With this versatile process you can heat practically any metal. You can anneal, harden, braze, or solder in a very short time and with great accuracy—the heated zone can be controlled to within a small fraction of an inch. It will pay you to investigate the many ways G-E electronic heaters can improve both your present and your future operations. Simply contact the nearest G-E office, or write to General Electric Company, Schenectady 5, New York.

NO. 5 IN A SERIES OF CASE STUDIES *on the accomplishments of G-E electronic heaters, a new and powerful tool that is speeding American war production. Like most new tools, it can easily be misapplied. The recommendations of G-E Industrial Heating Specialists are based on the experience gained with more than 200 installations of electronic heaters, plus a quarter century of experience in the development, manufacture, and application of electric heating equipment of all types.*

GENERAL ELECTRIC

ELECTRONIC HEATERS

Every week 192,000, G-E employees purchase more than a million dollars' worth of War Bonds.

Why you should specify ELECTRUNITE TUBING

Electric resistance welding, as employed in the manufacture of Republic ELECTRUNITE Tubing, is today the only process which consistently produces tubing with all these advantages.

It will help you improve the quality of your product. It provides the high strength to weight ratio of a tubular member. Its smooth surface takes any form of coating.

And it will help you to hold production costs down. Its unvarying uniformity means high workability. It is particularly suited to mass production methods of fabrication.

Plan now to use tubing—Republic ELECTRUNITE Tubing—in your postwar products. It is made in carbon, alloy and stainless steels—in a wide range of shapes, sizes and gauges.

Republic engineers and metallurgists are ready to help you obtain most efficient results. Write them.

REPUBLIC STEEL CORPORATION
Steel and Tubes Division
Sales Offices • Cleveland 8, Ohio
GENERAL OFFICES • CLEVELAND, OHIO
Berger Manufacturing Division
Culvert Division • Niles Steel Products Division
Union Drawn Steel Division • Truscon Steel Company
Export Department: Chrysler Bldg., New York 17, N. Y.

1. UNIFORM DIAMETER
2. UNIFORM WALL THICKNESS
3. UNIFORM CONCENTRICITY
4. UNIFORM STRENGTH
5. UNIFORM DUCTILITY
6. UNIFORM WEIGHT
7. SMOOTH, SCALE-FREE SURFACE
8. UNIFORM WELDABILITY
9. UNIFORM WORKABILITY
10. FREEDOM FROM HIDDEN DEFECTS

REPUBLIC STEEL CORPORATION, STEEL AND TUBES DIVISION, IS THE ONLY PRODUCER OF ELECTRUNITE TUBING.

Republic
ELECTRUNITE
Reg. U. S. Pat. Off.
MECHANICAL, AIRCRAFT AND PRESSURE TUBING

Cleveland
STEELWELD BULLDOZERS

FOR HEAVY POWER REQUIREMENTS

Truck braces made in three operations of .40 carbon steel 2 x 3-inch cross section bent to 5½ inches inside radius. No. 6 Bulldozer.

Bending heavy steel channels to 120 degree angle with top and bottom flange remaining at right angles to web. No. 4 Bulldozer.

Bending and forming a bead in flat pieces of dural for fuel tanks. No. 4 Bulldozer.

Cleveland Steelweld Bulldozers are especially advantageous for the bending and forming of heavy bars and plate, for forging and other work requiring tremendous power. By use of special tools and dies a variety of unusual operations can be performed. Crankshafts and refrigerator cabinets are examples of special work that are produced fast and economically on Steelwelds.

Because the frames are of the all-welded steel construction, far greater strength and rigidity are obtained for the weight of metal used than otherwise possible. Metal is incorporated exactly where the greatest good is accomplished. The frames have no bolted connections to loosen and cause misalignment. Strains are not confined to any single part, but are absorbed by the frame as a whole.

Every working part — drive gears, clutch, brake, ram and slides — have been especially designed to give extra long life and withstand abnormally hard service and even abuse. The splendid record of Cleveland Steelwelds since the first machine was built in 1930 attest to the quality of their construction.

THREE OF THE MOST POPULAR SIZES*

Model No.	Tons Capacity		Face of Ram	Height of End Lugs	Die Space With Ram Forward	Travel of Ram	Strokes Per Minute	Floor Space Required
	Mid Stroke	Bottom Stroke						
4	40	80	9″x56″	8½″	36″	18″	14	5′ 2″x12′ 9″
6	70	140	12″x64″	12″	42″	20″	11	6′ 2″x15′ 4″
8	110	220	18″x80″	16″	54″	24″	10	7′ 4″x19′ 0″

*Data on other sizes furnished upon request.

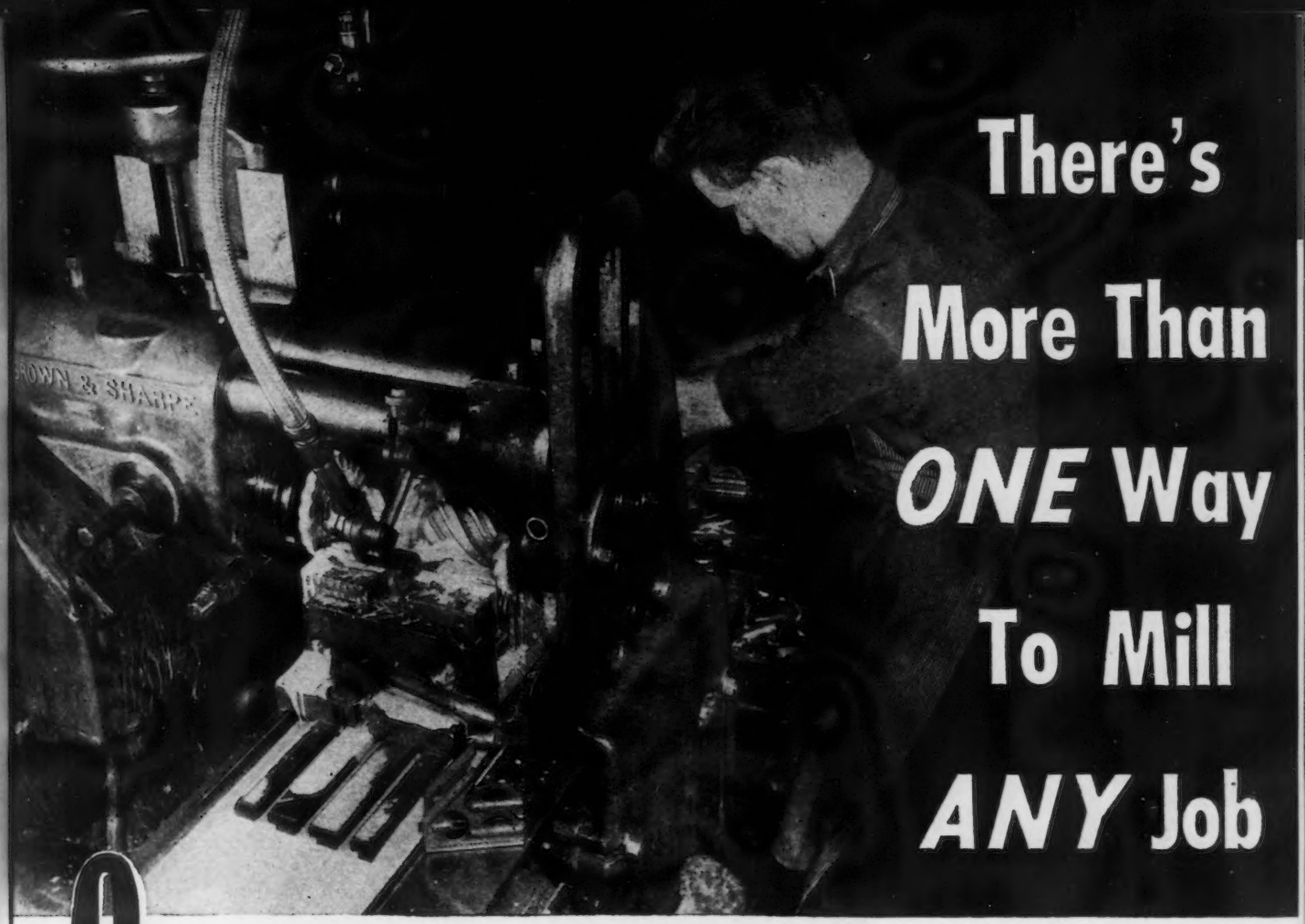
Descriptive literature gladly furnished free upon request.

THE CLEVELAND CRANE & ENGINEERING CO.

1115 EAST 283RD STREET • WICKLIFFE, OHIO.

CLEVELAND
STEELWELD BULLDOZERS

GENERAL SALES AGENTS: THE CYRIL BATH CO., E. 70TH & MACHINERY AVE., CLEVELAND



There's More Than *ONE* Way To Mill *ANY* Job

On the № 12 you can do it the BEST way

ILLUSTRATION — Production jumped 27% when Dual Feed Rate was used on this double-fixture job employing an automatic cycle automaticaly repeated.

Because Machine Provides Choice of These Methods

CONVENTIONAL MILLING — With speeds and feeds available to give maximum stock removal on all materials.

CLIMB MILLING — For those hard-to-hold jobs. Often permits use of higher feeds; with longer cutter life.

ROUGH-AND-FINISH MILLING — Rough by climb milling, finish by conventional milling as table returns — with only one chucking in one fixture. Ideal for formed cuts.

DOUBLE-FIXTURE MILLING— Employs an automatic cycle automatically repeated; eliminates loading time; requires only one set of cutters.

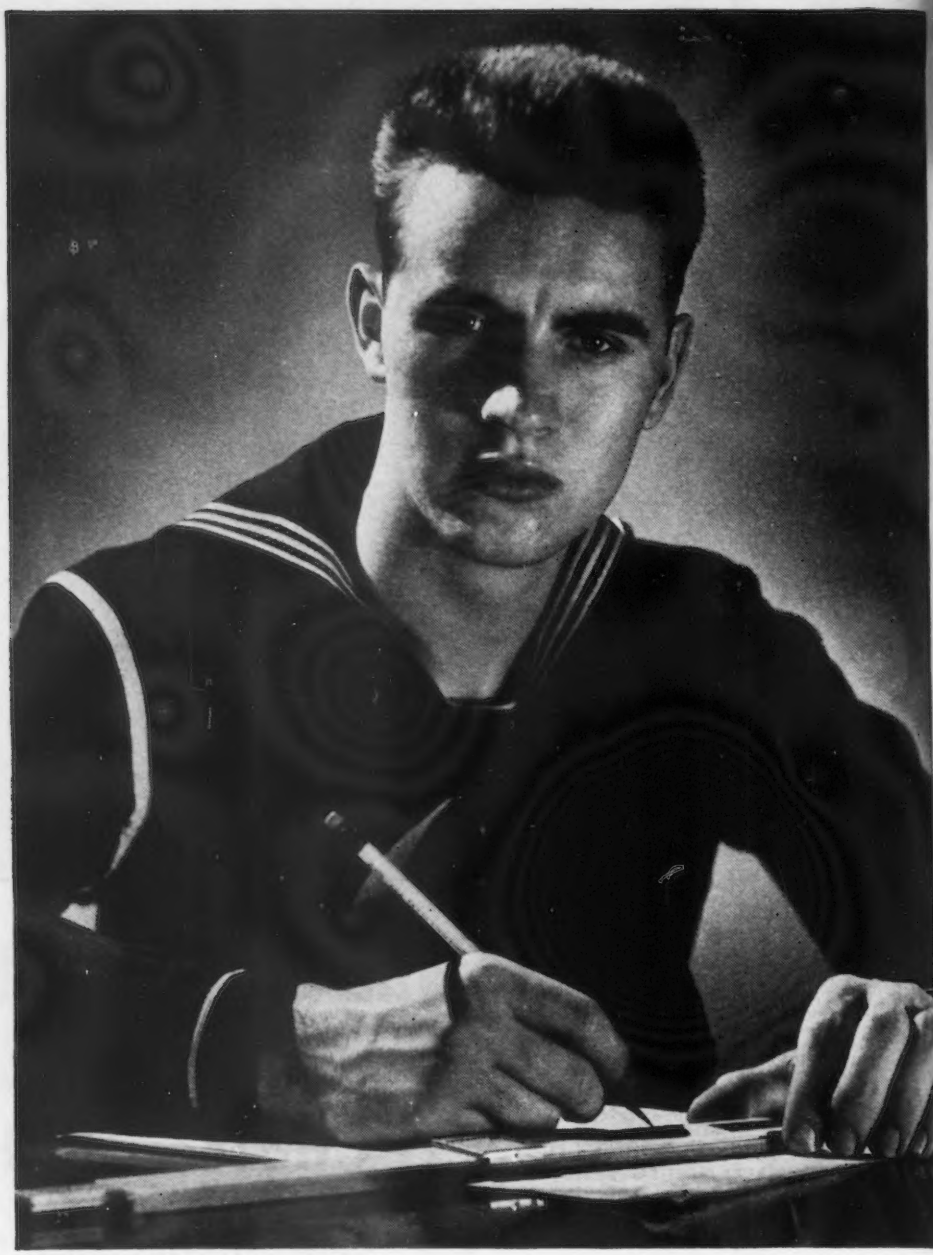
Also, on No. 12 Plain Milling Machines, Take Advantage of . . .

DUAL FEED RATE — Save on run-in. Reduce cutting time on work having varying stock depth.

ACCURACY OF TABLE CONTROL — Run in close to work in fast travel before dropping into feed; return to fast travel the instant cutter is clear of work. Make blind cuts with consistent accuracy.

BROWN & SHARPE MFG. CO. PROVIDENCE 1, R. I., U.S.A. B·S

BROWN & SHARPE



The man behind the Future

Behind our fighting forces is the greatest production effort in the history of the world.

Behind our production effort are the men of science... engineers, designers, researchers, mass-production experts.

Behind these mechanical wizards are the engineering students... the men of tomorrow on whose shoulders rests America's industrial future... your future.

These young men... many already in uniform... are passing up their football and hockey and best girls to cram four-year engineering courses into less than two years.

They are getting behind the war effort. The things they've learned are already at work in America's planes, tanks, guns, and ships.

And behind these students... with endless patience and devotion, giving freely of their minds and hands and time... are the veteran teachers.

Also backing them are America's leading industrial organizations... taking time, though busy on war jobs, to help these youngsters foresee the use and shape of future mechanical equipment.

Hyatt, for instance, regularly provides data of helpful interest for these knowledge-hungry engineers.

Our latest contribution is the Hyatt Engineering Handbook... a quick-reference manual containing a collection of original computations and other fundamental engineering data.

Such is the American way of getting things done, of planning ahead, of imparting knowledge to builders of tomorrow, of cultivating coming men as well as those who have arrived.

We've all got a stake in these young men. The stake is our future... America's future.

Let's give them all we've got.

HYATT BEARINGS
DIVISION OF
GENERAL MOTORS
HARRISON, N. J.

cts about scrubbing nd cleaning equipment by Aetna-Standard

1. Aetna-Standard has been building Cleaning and Scrubbing equipment for a quarter of a century.

2. We can design a COMPLETE line or any individual part in the line for you.

3. Our size range includes scrubbing and cleaning equipment for any commercial size sheet or strip.

4. Our engineers are experienced in all types of scrubbing and cleaning equipment.

SHEET SCRUBBING LINE

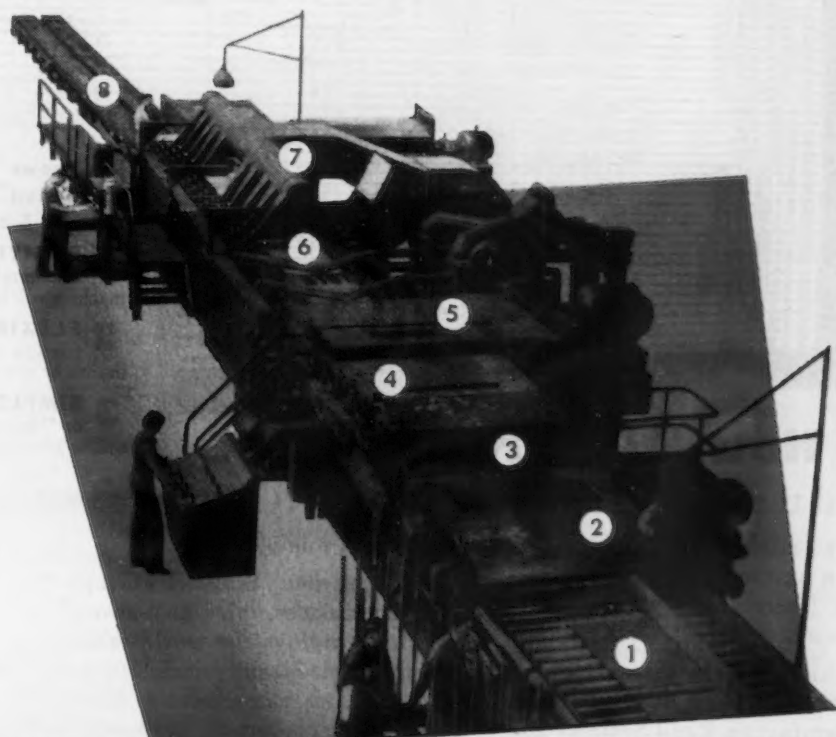
This is an example of a complete scrubbing line, which Aetna-Standard designed and built.

With this line, the operating department has a flexible size range to accelerate production. They can scrub and dry sheets in any gauge from 22 ga. to ¼", in widths from 18" to 77", in lengths from 4' to 16' at the rate of 100 to 400 feet per minute.

The individual units in the line include: skew roller table; acid dip tank; water spray box; alkali spray box; 12-roll scrubber; dryer; cooling disc conveyor; retractable oiling machine; piling unit; scale; and runout conveyor.

Production on this installation, according to the operating officials, has been extremely satisfactory.

1 Feed Table
2 Muriatic Acid Dip Tank
3 High Pressure Water-spray
4 Hot Alkali Solution Spray
5 Revolving Brushes and Hot Water Cleaning
6 Hot Air Blasts for Drying
7 Cold Air Cooling
8 Gravity Conveyor to Scale



The AETNA-STANDARD ENGINEERING COMPANY
YOUNGSTOWN · OHIO · U.S.A.
ARMY E NAVY

FACTS ABOUT AETNA-STANDARD

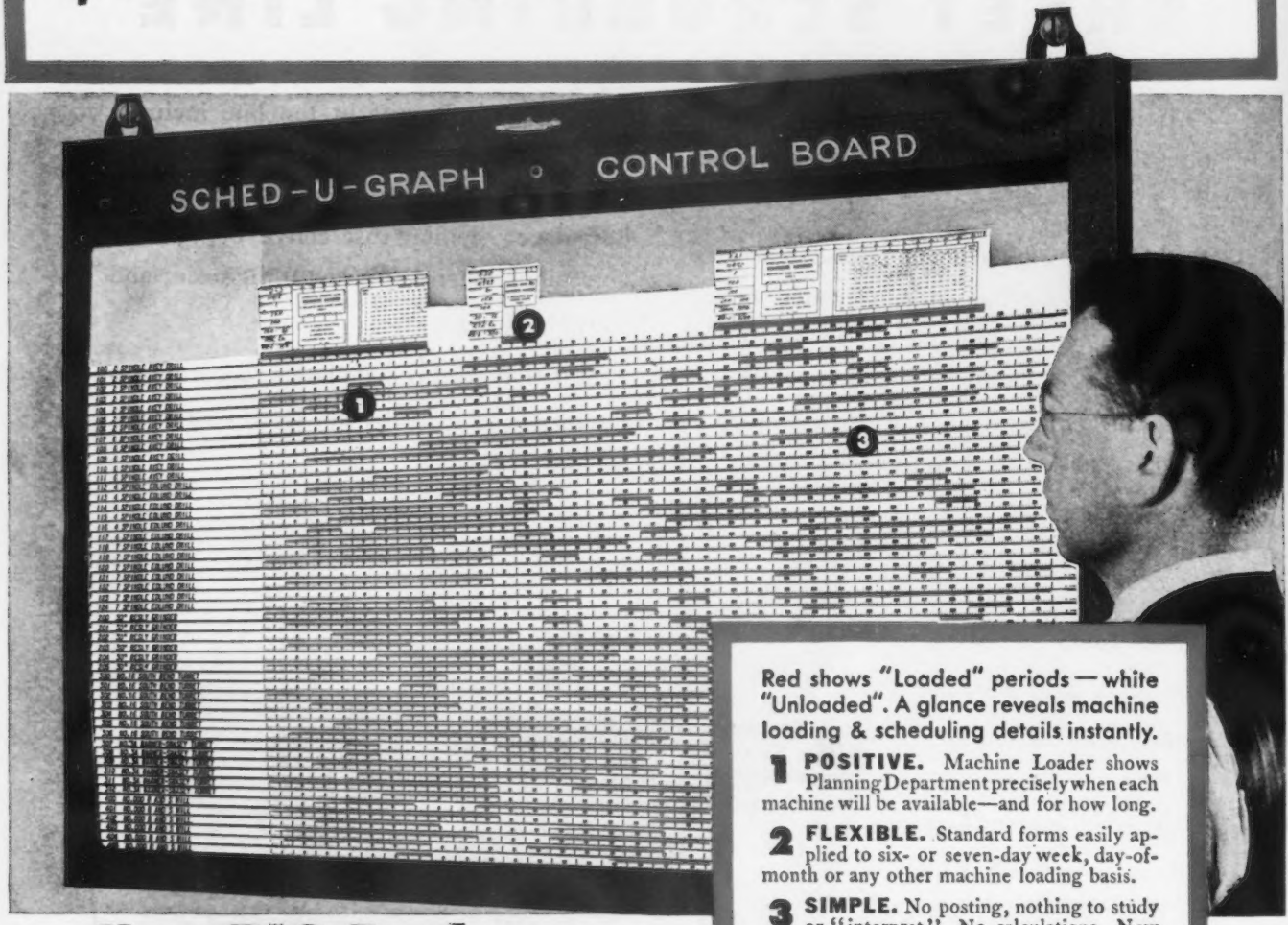
Aetna-Standard designs and builds all types of mill equipment, including:

Strip Finishing
Pipe and Tube Mills
Mill Rolls
Cold Working Machinery
Continuous Bar and Billet Mills
Tin Mill Finishing Equipment
Continuous Galvanizing and Long Terne Equipment
Small and Medium size Hot Rolling Mills

DESIGNERS AND BUILDERS TO THE STEEL, NON-FERROUS AND CHEMICAL INDUSTRIES

ASSOCIATED COMPANIES
Head, Wrightson & Company, Limited, Thornaby-On-Tees, England
John Inglis Company, Limited, Toronto, Ontario, Canada

New MACHINE LOAD System provides "TIME-TABLE" control



Red shows "Loaded" periods — white "Unloaded". A glance reveals machine loading & scheduling details instantly.

1 POSITIVE. Machine Loader shows Planning Department precisely when each machine will be available—and for how long.

2 FLEXIBLE. Standard forms easily applied to six- or seven-day week, day-of-month or any other machine loading basis.

3 SIMPLE. No posting, nothing to study or "interpret". No calculations. New orders promptly, economically scheduled.

How BIG Producers found the answer in SIMPLIFICATION

Improved machine utilization not only serves in wartime by stepping up production. It serves at *all* times by placing plants in a better competitive position.

With this double incentive, leading production executives have cooperated with Remington Rand Systems and Methods Technicians in perfecting a *visibly charted* system of machine load control that eliminates calculations and turns this formerly time-absorbing and often inefficiently done task into the simplest of routine operations.

Known as the "Sched-U-Graph" Machine Loader, this "final-answer" method employs the world-famous Kardex visible margin principle to show *at a glance, the exact schedule by hours or shorter periods* of every machine for an entire month ahead. Scheduling or coordinating work and determining delivery thereon has become a matter of "time-table" accuracy with the new method.

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SEND FOR NEW "SHOW-HOW" GUIDE to maximum machine utilization!

Remington Rand Inc., Buffalo 3, N.Y.

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SYSTEMS DIVISION

REMINGTON RAND

Buffalo 3, New York

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YOU are looking at a picture of the world's fastest cold strip mill! Rolling tin plate at the phenomenal speed of 3850 feet per minute, this new five-stand tandem mill is 50 per cent faster than any other cold strip mill. It holds the world's record for the production of tin plate.

One of the important contributing factors in attaining this improved operation is a revolutionary new control system centered around "the short circuit in harness"—the G-E AMPLIDYNE. The amplidyne provides more accurate control of the mill along with astonishing simplification in control circuits and auxiliary equipment.

Perhaps the machines you operate or manufacture for sale will require a different type of amplidyne system. But if they are driven electrically, the chances are good that amplidynes can effect similar results—higher output and better control of quality.

Whether it's a machine tool, arc furnace, power shovel, or gun turret, G-E application engineers will gladly help you determine how and where the amplidyne fits in. Call on them through the G-E office nearest you.

HAVE YOU READ "The Short Circuit that Moves Mountains"? **This 36-page book tells how a short circuit, together with load-current compensation, was incorporated in the amplidyne to produce a generator-type amplifier with amazingly fast response and amplification as high as 10,000 to 1. Ask for Bulletin GEA-4053. *General Electric Company, Schenectady, N. Y.***

HAVE YOU CONSIDERED THE AMPLIDYNE FOR THESE OTHER CONTROL JOBS?

Controlling speeds to maintain continuous process control

Limiting loads to protect electric and other equipment

Holding tension to maintain product uniformity in winding

Speeding acceleration to increase output of heavy machines

Positioning accurately to make machines more automatic

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AMPLIDYNES

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Standard Motor Control

FOR POSTWAR RECONVERSION

Westinghouse All-Purpose A-C Controls

Postwar reconversion will bring important control problems—you'll need all-purpose controls—and you'll need them quick.

Westinghouse is ready NOW to help you solve these problems—with a complete family of A-C Controls, a few of which are pictured here. They offer the maximum in flexibility of application and ease of installation.

Start now to anticipate your postwar control needs. For your assistance, Westinghouse has compiled a complete new volume of Control Buying Data (Catalog 7000). Get your copy today from the nearest Westinghouse district office (distribution will be made from district offices only—no mailings from Westinghouse headquarters). Westinghouse Electric & Manufacturing Company, East Pittsburgh, Penna.

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Across-the-line A-C Magnetic Starter for Squirrel-cage Motors.

Reversing and Non-reversing Magnetic Starter.

Autotransformer Type Magnetic Reduced Voltage Starter.

Starting and speed regulating Rheostat.

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Reversing Drum Switches for Across-the-line Starting.

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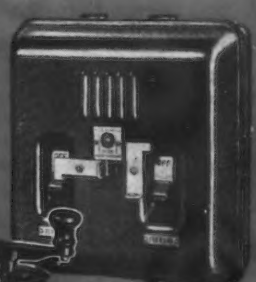
Manual Multi-speed Drum Controllers.

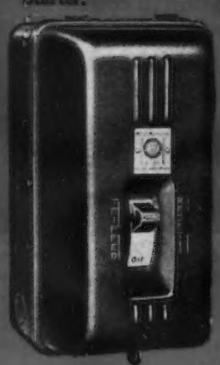


"De-ion" Motor Watchman Reversing and Two-speed Manual Starters.

Manual Multi-speed Drum Controllers.

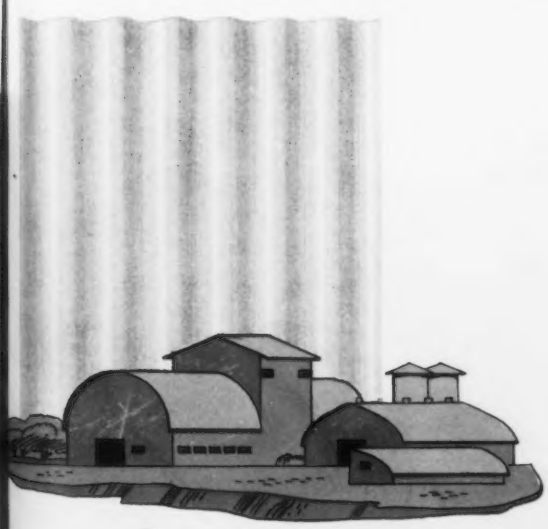
Reversing Drum Controller for use with Primary Resistance.

Across-the-line "De-ion" Manual Motor Starter.



Over 80% of the "Quonset" Huts are built with

WEIRTON GALVANIZED SHEETS



Weirton galvanized roofing and siding used on the "Quonset" Huts has been thoroughly war tested. From the arctic to the tropics it has successfully withstood the most severe corrosive conditions—steaming jungles—arctic blizzards—salt sea air. Its worldwide use is a testimonial to Weirton quality . . . This same quality is your assurance that Weirton's improved galvanized sheets will more than meet any requirement for farm or industrial structures.

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WITH SOUTH BEND LATHES

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South Bend Lathes can help you speed up production on toolroom and manufacturing operations. They have dependable precision, a wide range of speeds and feeds, and the strength and rigidity for effective use of tungsten carbide tools. Their ease of operation also contributes to their efficiency.

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★ BUY U. S. WAR BONDS ★

16″ swing, South Bend Toolroom Lathe

SOUTH BEND LATHE WORKS • *Lathe Builders for 37 Years* • South Bend, Indiana

Don't be stingy with your fillets

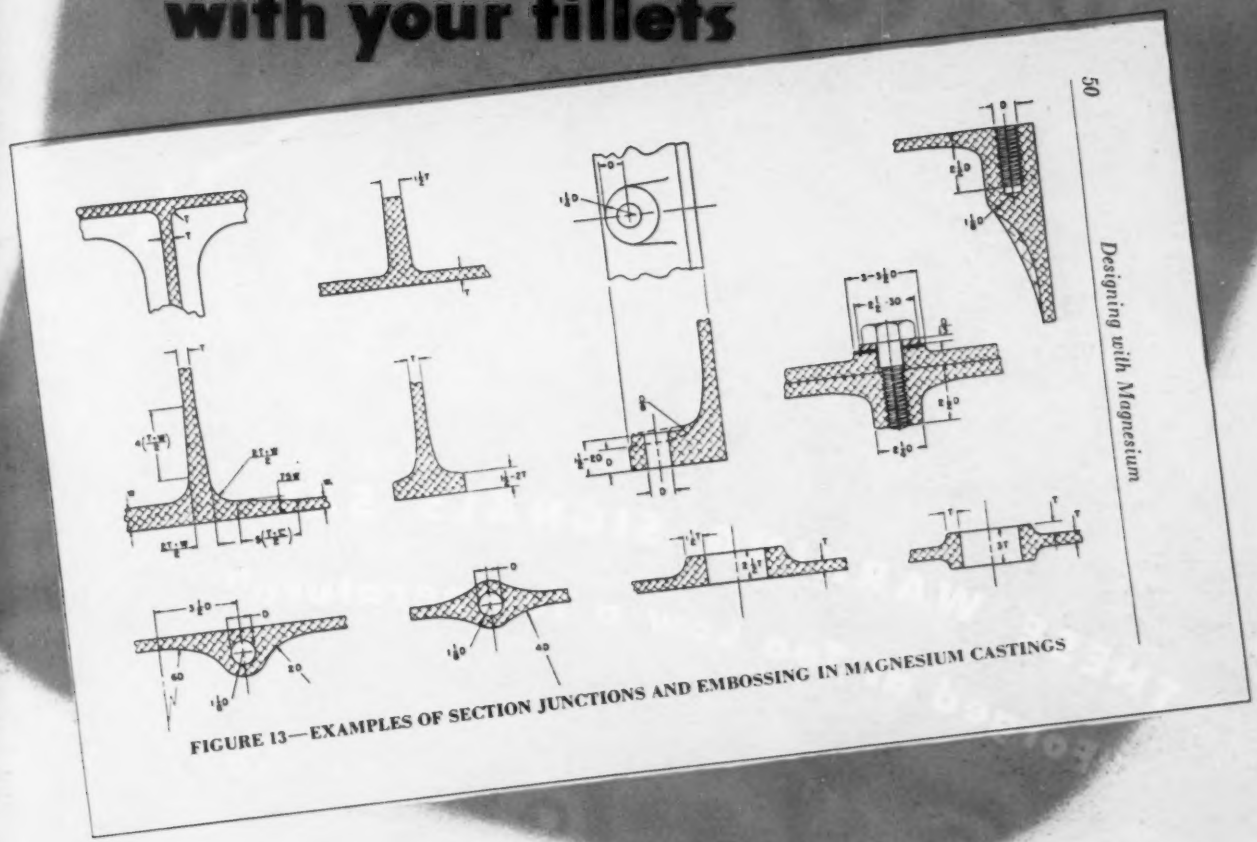

FIGURE 13—EXAMPLES OF SECTION JUNCTIONS AND EMBOSSING IN MAGNESIUM CASTINGS

You're out to save weight, using magnesium. But you don't add much weight by being generous with those fillets. And what a world of difference they make in the performance of a structural part.

As with other metals, careful blending where sections join, greatly increases the fatigue strength of a magnesium part. Large fillets, properly proportioned bosses, round corners on spot facing tools, all help avoid notch effects. Above you see a few suggestions on this subject, taken from American Magnesium's new book, "Designing with Magnesium".

Today, of course, the aircraft industry is using practically all of the products American Magnesium makes. Tomorrow, you'll certainly see this lightest of the lightweight metals stepping into an important place in our peacetime economy.

American Magnesium Corporation offers the knowledge of design, the skill in manufacturing, which come from more than twenty years of working with magnesium. Wartime or postwar products, our engineers are at your service. Write Aluminum Company of America, Sales Agent for Mazlo Magnesium Products, 1701 Gulf Bldg., Pittsburgh, Penna.

MAGNESIUM MAZLO PRODUCTS

AMERICAN MAGNESIUM CORPORATION

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Magnaflux* indications not only signal the danger points but they convey a specific message.

By standardizing on one or more of the Magnaflux non-destructive inspection methods, a plant can learn IF and WHERE trouble is likely to develop in every part produced.

What is even more important the indications can be interpreted to show WHAT caused the defect. It is only a step further to decide what to do to correct the trouble and pass only perfect parts to the customer in the completed product. The illustration shows a forged aluminum alloy pipe fitting with indications of cracks resulting from forging at too low a temperature.

These indications are produced by the newest Magnaflux Method — "Zyglo"*—the fluorescent penetrant method. Zyglo is being used with excellent results on aluminum, austenitic steels, bronze, ceramics and plastics as well as magnetic metals. Write for a fully descriptive bulletin.

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Since the pioneering stage of the original Magnaflux Method for steel, our engineers have sought to extend the benefits of rapid non-destructive inspection techniques in every field. In the metal working industries this activity has resulted in a constantly growing circle of satisfied Magnaflux users.

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LAY·SET *Preformed* IS FREE

The preforming process frees LAY-SET Wire Rope of muscle-bound stresses. Being preformed, Hazard LAY-SET is not hampered by needless strains. Rather, every wire and strand is free to do its full share of work from the very first hour it is put on your machine.

Hazard LAY-SET Preformed is a "pre-broken-in" rope; it resists snarling and kinking; it handles easier, faster, safer and cheaper. It possesses high resistance to bending fatigue and so lasts longer—much longer than non-preformed wire rope. Regardless of where or how you use wire rope, whether for running or standing service, specify Hazard LAY-SET Preformed—the rope that gives you greater dollar value.

Hazard LAY-SET Preformed Wire Rope is "in the service" on countless jobs for the Armed Forces where it is proving its many advantages. Specify it for *your* use.

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Continuous Electrolytic Plating Lines

★ ★ ★ HIGHEST SPEED PRODUCTION

★ ★ PLATES ONE OR BOTH SIDES

★ SAVES CRITICAL MATERIAL

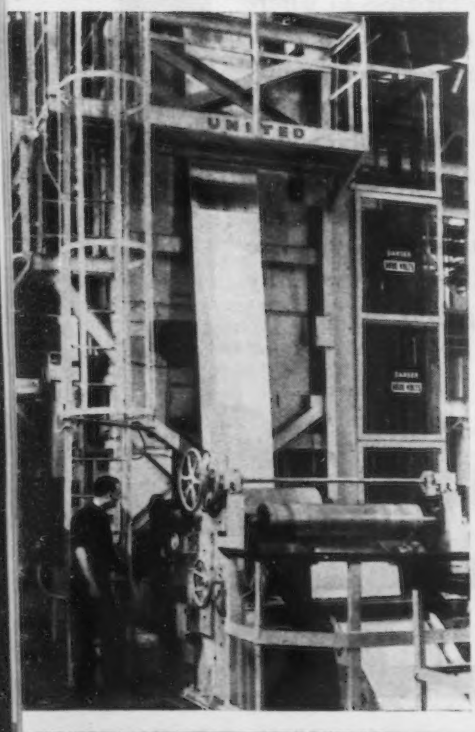
Developed in collaboration with the Hanson-Van Winkle-Munning Company of Matawan, N. J., UNITED CONTINUOUS ELECTROLYTIC PLATING LINES take strip steel in coil form from Cold Rolling Mills, and after side-trimming, cleaning and pickling, deposit tin on the strip electrolytically, producing finished tinplate at the rate of 1000 feet or more a minute, many times faster than by conventional hot dip methods. (★ ★ ★ *Up to 1300 feet per minute.*) ★ ★ One side of the strip, or both sides at the same time, may be plated with either a similar or dissimilar material in any desired thickness of coating. ★ Only about 1/3 as much tin is required than would be needed to produce the same amount of plate by hot dipping.

Comparable savings of time and metal are effected in the application of *zinc* coatings, with the added advantage of producing, by the electrolytic process, a tighter bond between zinc and steel than can be achieved by any other method.

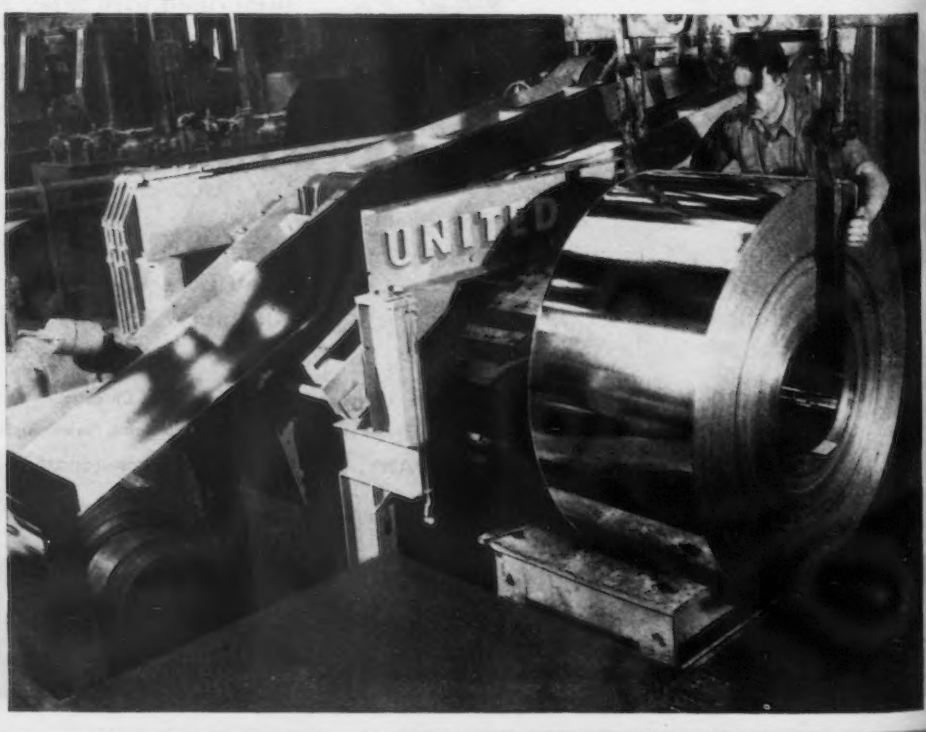
UNITED CONTINUOUS ELECTROLYTIC PLATING LINES in present daily operation are delivering consistently high quality tin and zinc plated strip at peak production with minimum interruptions for adjustments or maintenance.

Installation *now* of a UNITED CONTINUOUS ELECTROLYTIC PLATING LINE in your plant may not only solve present vexing cost and production problems, but assure you definite competitive advantages in the post-war market.

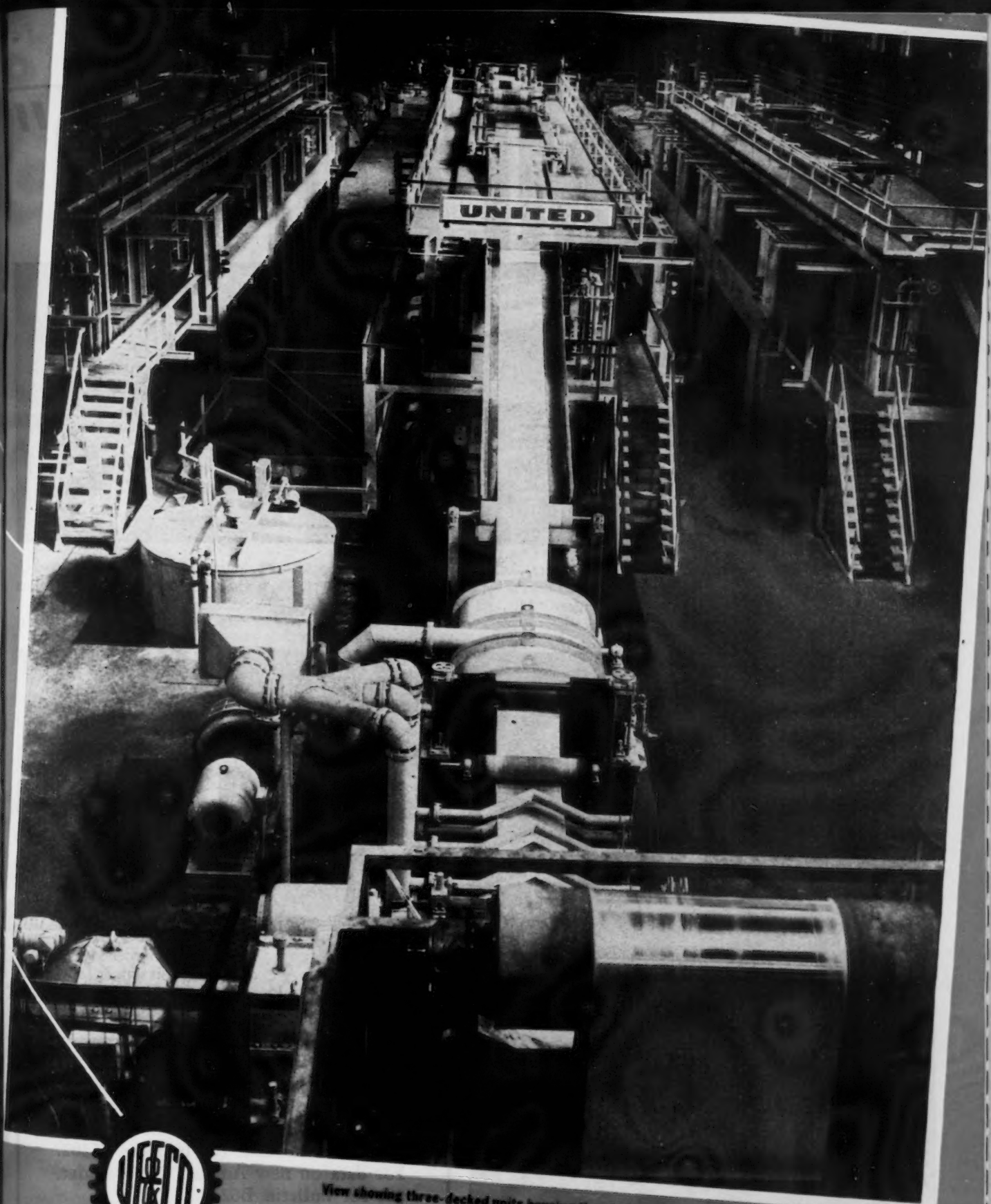
Consult UNITED engineers for further information, recommendations and estimates.



coated strip steel rising to top of electrical duction heater through which it descends to receive bright, shining surface.



Electrotinned steel strip in bright finish being removed at end of United Continuous Electrolytic Plating Line.



View showing three-decked units housing the plating cells of three separate United Continuous Electrolytic Plating Lines.

UNITED ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

Plants at PITTSBURGH · VANDERGRIFT · NEW CASTLE · YOUNGSTOWN · CANTON

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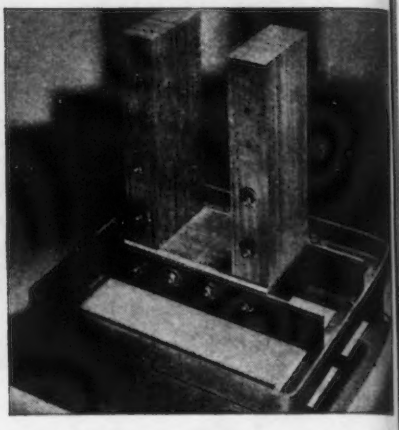
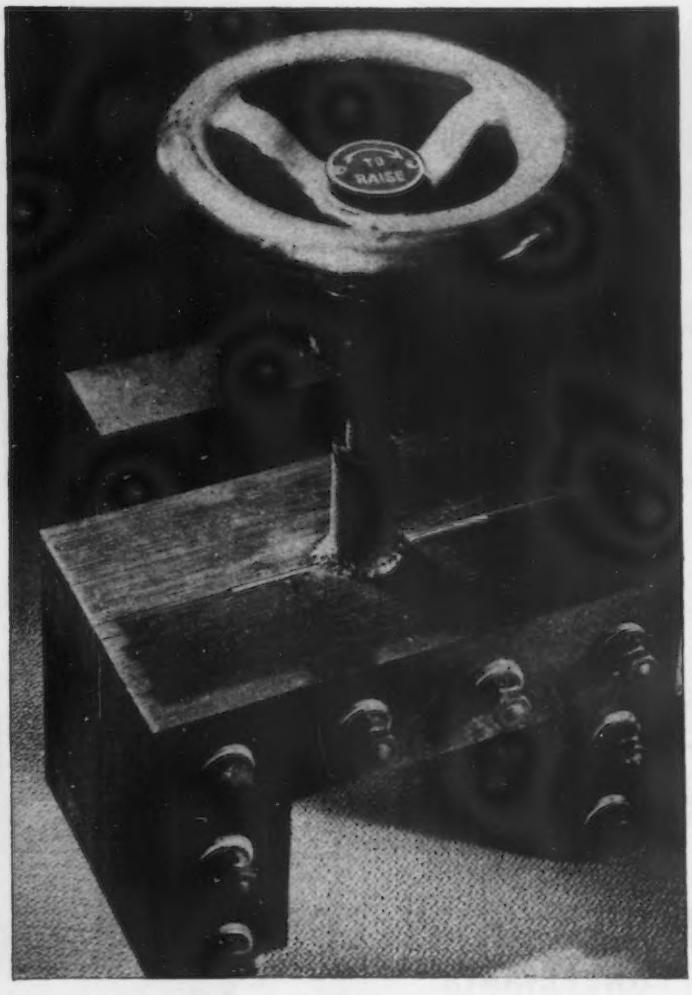
GET FINER AND FASTER A. C. WELDING WITH AMPAC "400"

1 Revolutionary new patented circuit *increases* efficiency — *cuts* idling loss! Entire construction is *simple, rugged!*

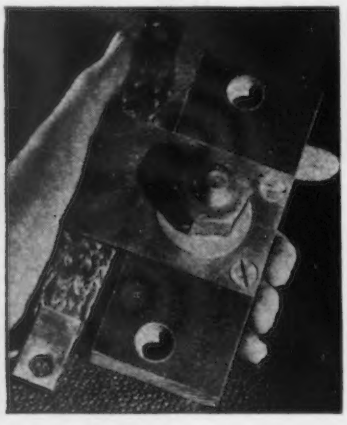
2 Transformer coil uses *rectangular* copper — glass-insulated — with primary over secondary. Air duct between windings dissipates heat — *prevents* breakdown!



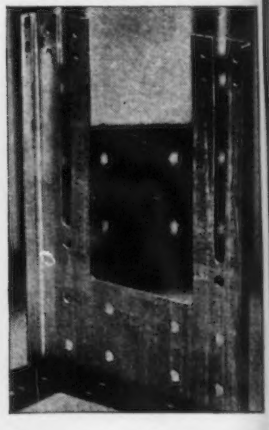
3 Sturdy lower core is 1-piece, U-shaped . . . of die-punched silicon steel. Insures quiet operation . . . with *no* power-wasting air gaps!



6 Power regulation is *smooth — quick — simple!* One-inch movement of upper core covers entire welding range — 50 to 500 amps — in *seven turns* of control wheel. Cuts adjustment time to *minimum.* Speeds welding! A 1677



4 Here's typical Ampac quality — a big, tough, *extra heavy* welding terminal. Note *brazed* connections!



5 Hardened brass guide is simple, fool-proof! Channel shape provides *extra* strength.

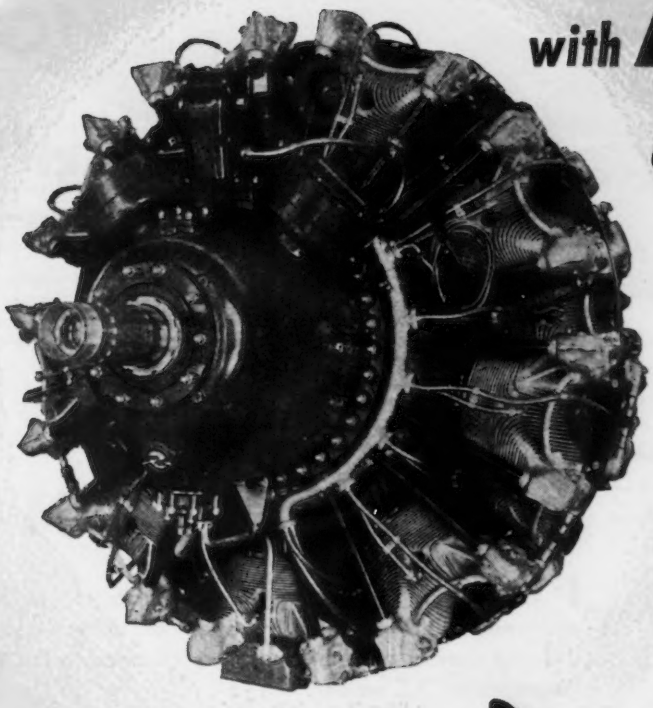
GET COMPLETE FACTS on this brilliantly engineered a.c. welder from your nearby Ampac dealer or Allis-Chalmers district office. Ask for bulletin B6302. For data on new Ampac "200" welder, ask for bulletin B6241.

ALLIS-CHALMERS

MILWAUKEE, WISCONSIN

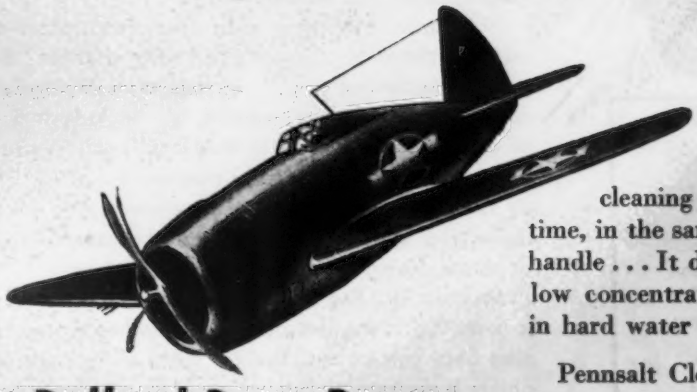
PRATT & WHITNEY AIRCRAFT

cleans engine parts



with PENNSALT CLEANER K-7

Reg. U. S. Pat. Off.



in the Bullard-Dunn Process

An important metal cleaning job in this plant is the removal of scale and oil from Pratt & Whitney aircraft engine parts. Pennsalt Cleaner K-7 was demonstrated in the Bullard-Dunn Process with highly satisfactory results, at a concentration of only 10 ounces per gallon.

Here are the outstanding advantages of this Pennsalt Cleaner: It does *not* leave a film . . . Both cleaning and defilming are done in minimum time, in the same tank . . . Pennsalt K-7 is easy to handle . . . It does not fume . . . It can be used at low concentrations . . . And it is suitable for use in hard water areas.

Pennsalt Cleaner K-7 was designed specifically for the cleaning and defilming operations in the Bullard-Dunn Process and has been thoroughly tested and approved by The Bullard Company.

Pennsalt Cleaner K-7 is one of a complete line of Pennsalt Cleaners available for all types of metal cleaning. If you have a wartime metal cleaning job, by all means make use of the wide experience of our technicians. No obligation. Simply write fully about your problem to our Pennsalt Cleaner Division, Dept. I.

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HAS BROUGHT AN UPSWING in WELDING PRODUCTION

IF you want to increase welding output by 15 to 30%—and reduce power costs by 30% or better — join the growing number of plants that have changed to the Wilson "Bumblebee" AC welder.

Shipyards, aircraft plants, steel fabricators and metal-working shops of all types are finding that the "Bumblebee" permits faster welding with better quality welds than DC machines of equivalent capacity (particularly on deep grooves or corners). In addition, its built-in capacitors provide better power factor, which relieves overloaded power lines as well as lowering power costs. Maintenance time and costs are lower, too, since the "Bumblebee" has no parts which move or rotate during welding.

Made in 300 and 500 ampere capacities, the "Bumblebee" is available in standard and All-Weather types. Special running gear can be supplied (at slight extra cost) where portability is desired. Wilson AC welders are made in sizes from 100 to 1000 amperes capacity. Write for free Catalog ADW-53 for detailed description — use the coupon for convenience.

FOR TOP FLIGHT AC WELDING
WILSON 530 AC ELECTRODE

Perfect teammate for the "Bumblebee" is the all-position AC electrode—Wilson No. 530. It produces high quality welds that conform to these specifications:

AWS Filler Metal, Spec. E6011

Navy Bureau of Ships, Spec. 46E3, Grade III, Class I

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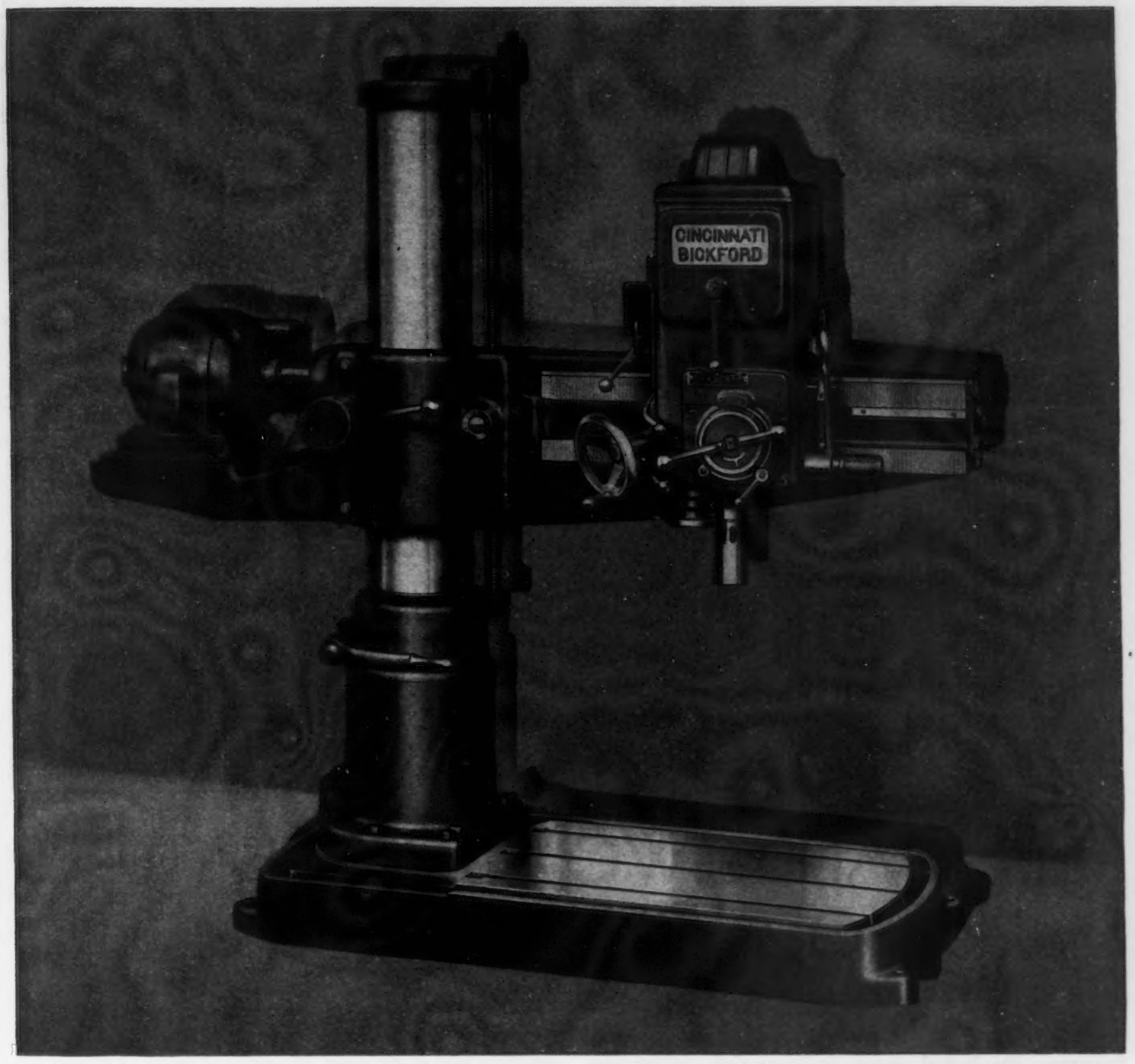

DRILL MORE HOLES PER DOLLAR

with this 9" dia. column, 3' or 4' arm, High Speed Super Service Radial Drilling Machine. It can be obtained with any one of six different standard speed ranges containing nine spindle speeds . . . the fastest—3500 RPM to 175 RPM . . . the slowest—1200 RPM to 60 RPM. A single lever controls all speed changes. Speed and feed plates read directly. Drill diameters and corresponding spindle speeds are shown. There are four rates of power feed and five different methods of feeding the spindle by power feed, ratchet lever, knurled grip, quick return levers, and spot facing handwheel.

The simplicity and ease of operation of this machine will surely increase your drill department output.

Write today for further information about this or our other radial or upright metal drilling machines.

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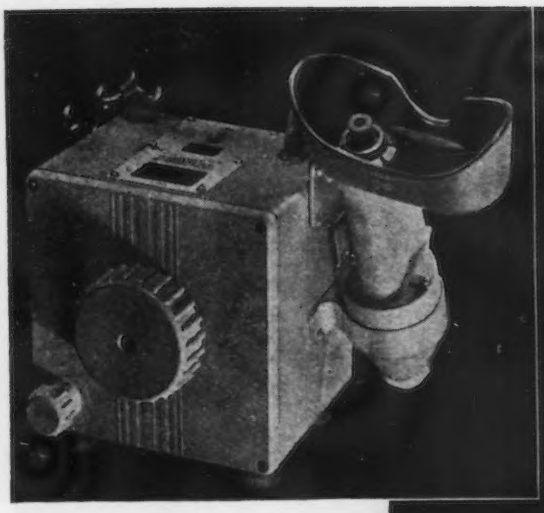

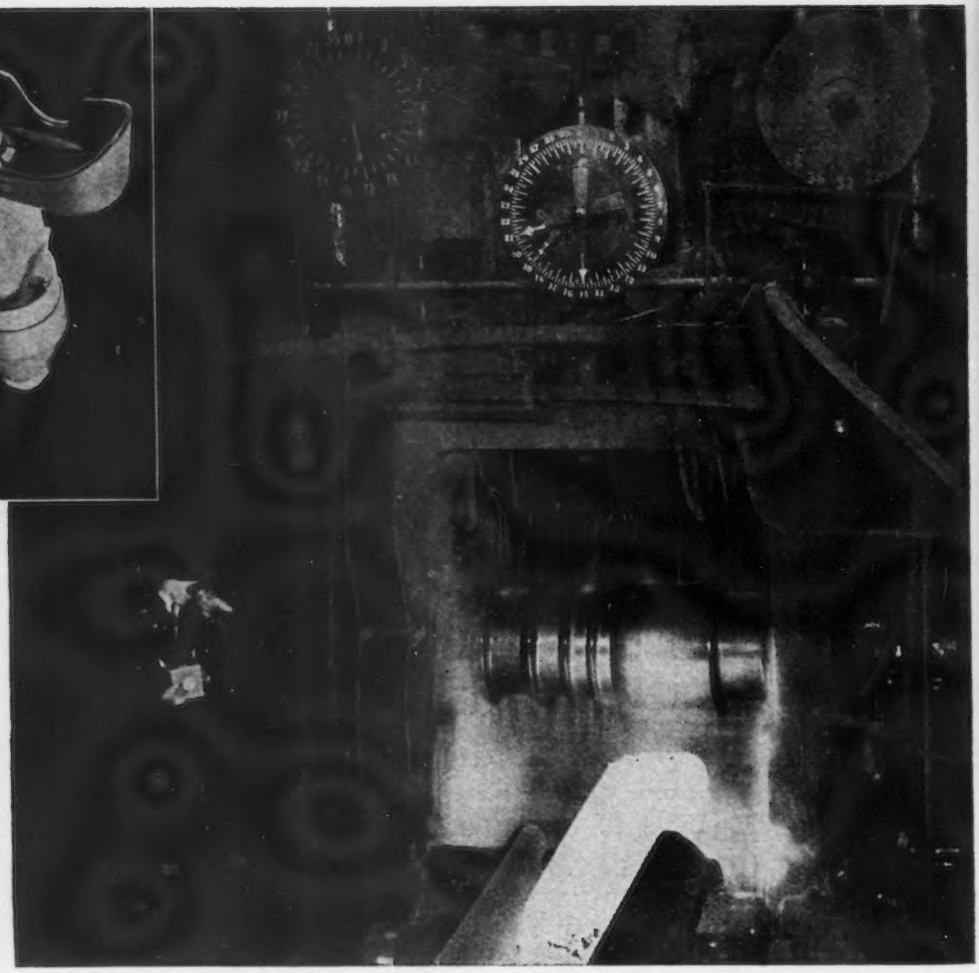

Above—L&N Direct-Reading Potentiometer-Type Optical Pyrometer, with Telescope in carrying strap on Control Box.

Right—Rolling-mill temperatures were among the first uses of L&N Optical Pyrometers, many years ago. The added speed of the Potentiometer Optical makes it even better suited to this service.

SPEED AND TWO OTHER FEATURES
Mark L&N Optical *Potentiometer* PYROMETERS

Speed, accuracy and a direct-reading scale are the three features which make the L&N Optical Potentiometer Pyrometer the logical choice for measuring the medium and high temperatures of industry. Lightweight and rugged construction are additional advantages in operations where the instrument is in steady service.

Operation is simple. When the user sights through the instrument's telescope, he sees the hot object with great clearness, and outlined against it he also sees the glowing filament of a small electric lamp. The user simply turns the large knob on the box until this filament vanishes against the hot object; then turns the smaller knob until a pointer on the box comes to zero; and the temperature scale turns simultaneously to the correct temperature, in degrees.

The operation is so obvious and exact that different inspectors, on the same process, will closely match each other's readings—a great advantage if more than one inspector checks a process, or if one man checks the charging temperature of a ladle and another checks its pouring temperature.

L&N Optical Pyrometers are made in three Fahrenheit and three Centigrade ranges, as follows: 1400 to 3200 F and 1400 to 5200 F for black-body temperatures, and 1400 to 3200 F for molten-metal temperatures; also 775 to 1750 C and 775 to 2800 C for black-body temperatures, and 775 to 1750 C for molten-metal temperatures.

An L&N engineer will be glad to call on you regarding the use of an L&N Optical, or will send Catalog N-33D, as you prefer.

Jrl Ad N-33D(5)

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This Week in The IRON AGE

Vol. 153, No. 13 — March 30, 1944

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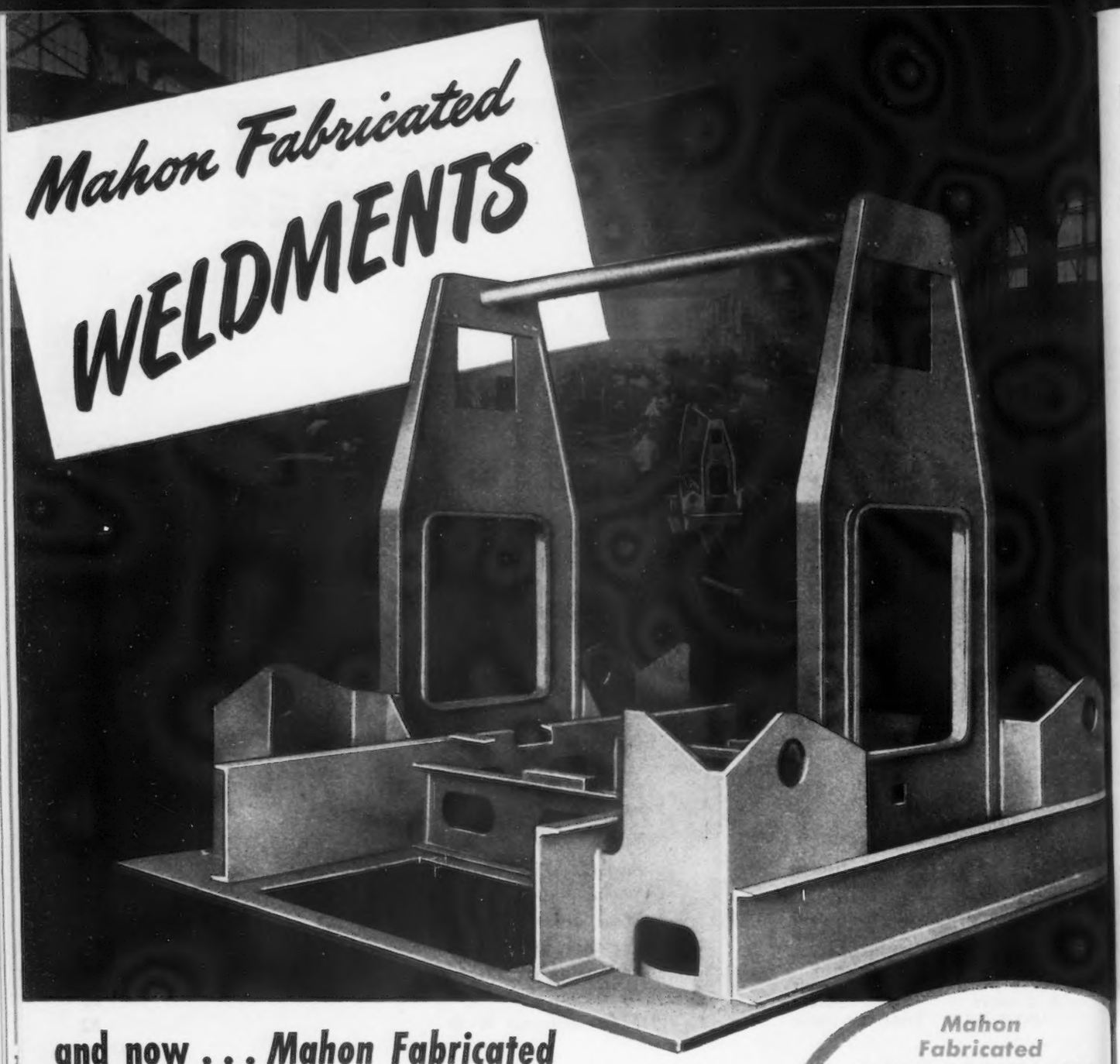

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Turn About is Fair Play

IN any game, turn about is fair play. Baseball, for example, would not be as popular as it is if only one team came to bat.

No one can complain if a government stays at bat during a war but ours had been consistently hogging the plate even before that. Long before the war, government had its committees to investigate business and industry and the process had continued up to date.

The TNEC for example went through the steel industry and others with a fine tooth comb and the enthusiasm of a witch hunt. More recently, the Truman Committee, has been doing considerable business on a free lance basis. What these committees have uncovered that would justify the time and expense of maintaining them is open to question.

Be that as it may, no one can seriously challenge the right of government to poke its nose into the affairs of private citizens in this free country, providing it does so impartially, non-politically and for the benefit of the public. But parenthetically, it might be said that these rather important qualifications have been overlooked in a number of investigations which have been obviously tinged with partiality and political motive.

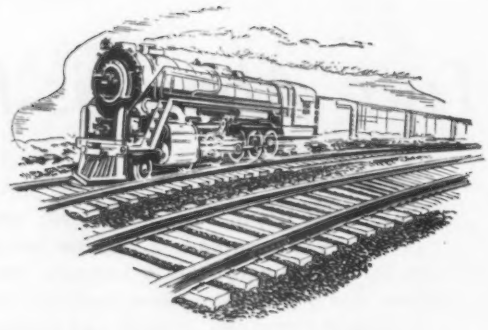
The point I wish to bring out in this matter is that turn about is fair play. Under our constitution and in a land where government is the servant and not the master of the people, private citizens have just as much right to investigate government, on these same terms, as government has to investigate them. And such investigations made by qualified people and resulting in constructive criticisms might be salutary.

Gaston F. DuBois, the distinguished vice-president of the Monsanto Chemical Company, exposed this thought in his address before the Society of Chemical Industry recently. Speaking on the occasion of the award to him of the Perkin medal for outstanding service in applied chemistry and with special reference to our chemical scientists, he suggested that it might be a good thing for a committee of chemists, chosen from private industry to investigate government chemical research projects and report upon the desirability of the projects being undertaken as well as upon the efficiency with which those already underway or completed have been conducted.

The thought expressed by Mr. DuBois is applicable, of course, not only to chemical research under government auspices but also to all industrial and business activities in which government participates. Applied in the field of metallurgy it certainly would have killed in embryo the project that fathered or rather mothered the metallurgical monstrosity known as the Lincoln penny. That this would have been in public interest is something no one can dispute.

Unfortunately there is no established procedure whereby such committees could be set up except informally and they would lack the power of subpoena. However, this lack would be offset by the publicity that would be naturally given to recognized experts reporting on matters of public interest.

Perhaps this thought can be translated into action by some of our professional societies and industrial associations.



Help the Railroads Handle Growing War Traffic

American railroads are performing a herculean task in handling the country's swollen wartime traffic. In this time of huge jobs and of unusual accomplishments, theirs stand out as almost incredible.

Despite the shortages of manpower, equipment, and materials which beset all industry today, American railroads continue to handle the ever-growing load placed upon them.

Freight traffic in 1943 amounted to 725 billion ton-miles—14 per cent above 1942, and passenger traffic in 1943 increased to 85 billion passenger-miles—58 per cent more than in 1942. Facilities were stretched to what seemed their limit to meet the demands of 1942. Yet in 1943 the increased traffic was handled with less than one per cent more freight cars, and with practically the same number of passenger cars. Remarkable as their past performance is, American railroads will be called upon to excel it in 1944, handling even more men and materials as we go into the critical, invasion phase of the war.

Meeting these huge transportation demands requires the complete cooperation of all shippers—loading cars to capacity, holding car detention time to the minimum, and doing everything possible to boost operating efficiency and car utilization. By careful planning Inland Steel Co. has speeded up car loading and unloading, and has increased the average weight of outgoing carload shipments 30% over prewar shipments. During the past two years Inland has thus saved literally thousands of valuable car-days.

Continued public support of American railroads is needed to speed men and materials to Victory. They need our help and deserve it.

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► WPB has spiked the rumor that it will make compulsory the use of alloy scrap in the blast furnace. No such proposal is being considered the board maintains.

► H. K. Ferguson's market survey reveals that an unprecedented program of industrial construction in the South awaits only the release of materials. Of the total volume of industrial building, 75 per cent will be for the expansion of present facilities and for space in which to manufacture entirely new products.

► WPB will permit the use of materials for the development of products designed for future civilian markets. Only restriction on such development is that the company may not divert manpower, technical skills or facilities from war work.

► Washington observers are predicting the end of the Surplus War Property Administration by Congressional action. The House Banking and Currency Committee resent the designation of Treasury Procurement as the agency to dispose of consumer goods in the executive order establishing SWPA.

John M. Hancock's testimony before the committee supported SWPA. The co-author of the Baruch-Hancock report thinks enactment of legislation regarding contract termination more urgent than legislation on surpluses.

► International Harvester Co. has asked the WPB to release materials and machinery to build a factory at Memphis, Tenn., for the production of mechanical cotton pickers.

This company's tank contract, cancelled a year ago, amounted to $217 million, the largest industrial project terminated by the government up to that time. Commitments to 437 subcontractors on the contract had amounted to $90 million. Exclusive of profit, to be negotiated, Harvester expects to receive from the government a grand total of $26,500,000 on the project.

► Calibre .50 machine guns have dropped in price from $510 to $200 each in one contractor's plant; light tank prices have dropped from $45,000 to $22,564 in the past year; and, one type of 105 mm. shell has dropped from $5.97 to $3.75.

► Industrial employment in the Chicago area at the end of 1943 is estimated to have been double that of 1939. In 1943 alone, factory payrolls are believed to have risen 28.3 per cent.

► Downbeat outside Cassino: Ordnance reports that Rudolf Heppel, a former dance band trumpeter, rouses troops with "Stardust", or a request number. His captain recently requested "Begin the Beguine".

► The Spanish air line, Ibera, has put into commission several U.S. Flying Fortress bombers which have made forced landings on Spanish territory from time to time. The U.S. O.K.'d the use.

► Congress will probably not press for the early establishment of the Office of Civilian Demobilization which would curb Army say-so on the "when" of Reconversion Day.

If some military program slipped, it would give the White House the chance for making political capital of a Congressional boner in starting civilian production too soon.

► Three new machine tools have been completed in Detroit: One that all but eliminates drill breakage by automatic reversal of the head when chips pile around the flutes; a machine which shapes gear teeth around the circumference simultaneously, and a machine which broaches to spherical dimensions.

► A program for partial resumption of automobile production at the conclusion of fighting in one of the two major war zones is expected to result from the April 17 meeting of automotive executives and the Automotive Branch of WPB.

► To insure the selection of correct tool steels for various tooling applications, Consolidated Vultee Aircraft Corp. has substituted simple mark-and-number codes for tool steel trade names. These symbols are used in the tool design, heat treating and purchasing departments as well as in the tool room.

Since the adoption of this coding system, tool breakage figures have slumped to a new low, countless manhours of highly skilled labor have been switched to productive efforts and tool production has swelled to meet demands of expanding tool programs.

Tool Steel Coding

. . . By substituting for proprietary names a mark and number code based on chemical analysis of the tool steels, the Consolidated Vultee Aircraft Corp. has been successful in increasing cutting tool efficiency and improving tool life. Details of this system are fully outlined.

WHICH tool steel should be used for which tool is a complicated problem confronting aircraft manufacturers whose precision tools must be formed to rigid specifications if vital airplane parts are to be formed within tolerances as close as 0.0005 in.

By coding tool steels according to chemical analysis, Consolidated Vultee Aircraft Corp. virtually insures the selection of correct tool steels for various tooling applications, and the use of proper heat treating processes for tool steels. Simple mark-and-number codes have replaced tool steel trade names in the tool design, the heat treating and the purchasing departments as well as in the tool room. Since adoption of Consolidated Vultee's new coding system, tool breakage figures have slumped to a new low, countless man hours of highly skilled labor have been switched to productive efforts, and tool production has swelled to meet demands of expanding tooling programs.

Charles L. Hibert, assistant chief of manufacturing research for the corporation, and J. E. Lynch, tool steel materials engineer, prepared the new tool steel program. Hibert, an expert in the field of metallurgy, and Lynch, a tool steel man for 30 years, combined principles of metallurgy and tool steel application to arrive at the coding system, designed to assure the proper purchase, selection, use and heat treatment of tool steels.

The object in coding tool steels was threefold: (1) To correlate trade names with a definite chemical analysis; (2) to correlate heat treating practice, as given by various manufacturers, with the specification analyses of the subject groups; and (3) to devise a company designation for these steels to avoid shop confusion by reference to steels by codes instead of by trade names.

An effort was made to select only the steels that do not contain critical metals to any great extent. Tool steels are divided into five groups and are designated by Convair as follows:

Group 1: General purpose tool steels; marked with a circle stamp.

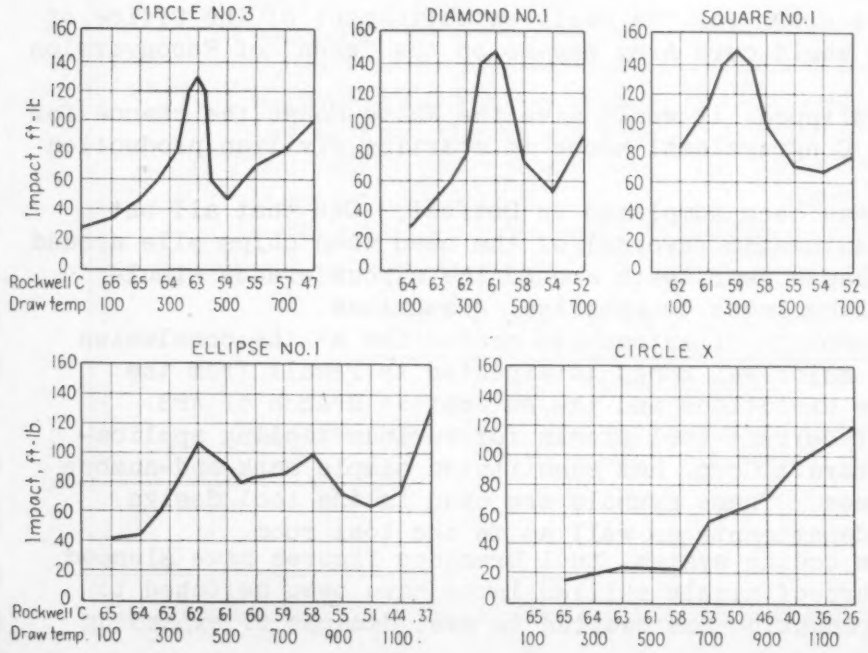
Group 2: Oil hardening die steels (non-deforming); marked with a diamond stamp.

Group 3: Silicon-manganese shock resistant chisel and punch; marked with a square stamp.

Group 4: High carbon, high chromium punch and die steels; marked with an ellipse stamp.

Group 5: High speed tool steels; marked with a triangle stamp point.

FIG. 1—Drawing temperatures of Convair tool steels for maximum hardness and toughness.



The marks, surrounding a center numeral, form the various codes. Small numerals are grouped so as to spread over a definite chemical analysis. For example: Group 1 "circle 1" code, indicates low carbon steel; "circle 2," medium carbon steel; and "circle 3," special carbon steel.

This information is catalogued in Table I, a classification table of Consolidated Vultee's tool steel code designations as to description, approximate cost per lb. and the material code (mark-and-number code, plus abbreviations of the type of steel) for each of the five groups.

Table II, a conversion table of codes to chemical analyses of each of the five groups, lists the element percentages of chemicals contained in each type of tool steel. The table is used by the purchasing department, and by vendors, for determining Convair's tool steel specifications as to analyses.

Codes on Raw Stock

Tool steel codes are stamped in letters ¼ in. high on all raw stock that comes into the tool room. Each tool design drawing bears the code of the proper steel to be used in tool manufacture, the material coding and the Rockwell reading desired. After manufacture of a tool, the code again is stamped on the finished product in ⅛ in. letters. If a tool is broken, chemical analysis is determined from the code. Heat treatment of the particular steel contained therein may be traced readily. When discarded tools are salvaged, needed alloys may be located by checking codes in Table II.

A third table is a conversion table of company insignia to standard trade names. In addition to designating the various classifications of tool steels by codes, the table contains the names and addresses of local distributers whose supplies of each particular type of steels are readily available.

Steels recommended for specific tooling applications are charted in Table III, which catalogues the names of tools manufactured by the company; the steels recommended (by codes), with a first and second choice given; the qualities desired in each tool; and the Rockwell hardness number desired for each type of tool. This table is useful for tool designers who may look under arbor nuts, for example, and find the code "square 1" tool steel should be used. The tool designer marks the code on the drawing which goes to the tool room. Table I reveals that "square 1" is a silicon - manganese punch and chisel steel.

A series of 14 charts gives the specifications of all tool steels stocked by Consolidated Vultee for tooling purposes. From the charts, tool designers may ascertain the standard sizes and shapes of tool steel available for use in tools. The use of these charts has been responsible for reducing the machine operations required on stock from three operations to the

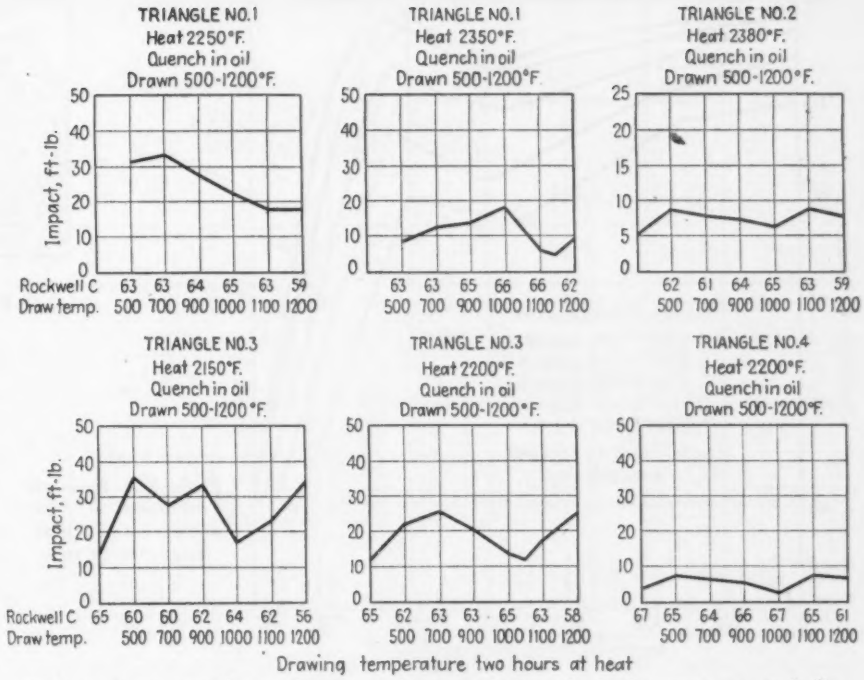


FIG. 2—Impact-toughness of high speed tool steels from the Izod impact test. In ft.-lb.; diameter 0.505 in.

TABLE I
Classification of Tool Steels

CLASSIFICATION		DESCRIPTION	APPR. COST PER. LB.	COLOR CODE	MAT'L. CODE
GROUP	C.V.A.G. DESIGNATION				
1	CIRCLE 1	S.A.E. 1020	.10 .05		① C. R. S. ① H. R. S.
	CIRCLE 2	S. A. E. 1050 PLOW STEEL	.12 .06		② C. R. ② H. R.
	CIRCLE 3	CARBON TOOL STEEL	.10 .27		③ T. S. ③ DR. RD.
	CIRCLE X	"GRAPH-MO" GRAPHITIC TOOL STEEL	.39		Ⓧ T. S.
2	DIAMOND 1	OIL-HARDENING DIE STEEL NON-DEFORMING	.35 .65		◇1 T. S. ◇1 DR. RD.
	DIAMOND 2	OIL-HARDENING DIE STEEL NON-DEFORMING	.38 .90		◇2 T. S. ◇2 DR. RD.
3	SQUARE 1	SILICON - MANGANESE PUNCH AND CHISEL STEEL	.41 1.20		□1 T. S. □1 DR. RD.
4	ELLIPSE 1	HIGH CARBON - HIGH CHROMIUM PUNCH AND DIE STEEL AIR-HARDENING	.60		① T. S.
	ELLIPSE 2	HIGH CARBON-HIGH CHROMIUM PUNCH AND DIE STEEL OIL-HARDENING	.65		② T. S.
	ELLIPSE 3	(S.A.E. 52100) CHROME ROLL OIL-HARDENING	.22		③ T. S.
5	TRIANGLE 1	HIGH SPEED TOOL STEEL TUNGSTEN TYPE	.92		△1 H.S.S.
	TRIANGLE 2	HIGH SPEED TOOL STEEL TUNGSTEN-COBALT TYPE	1.04		△2 H.S.S.
	TRIANGLE 3	HIGH SPEED TOOL STEEL MOLY-TUNGSTEN TYPE	.85		△3 H.S.S.
	TRIANGLE 4	HIGH SPEED TOOL STEEL MOLY-TUNGSTEN-COBALT TYPE	.92		△4 H.S.S.

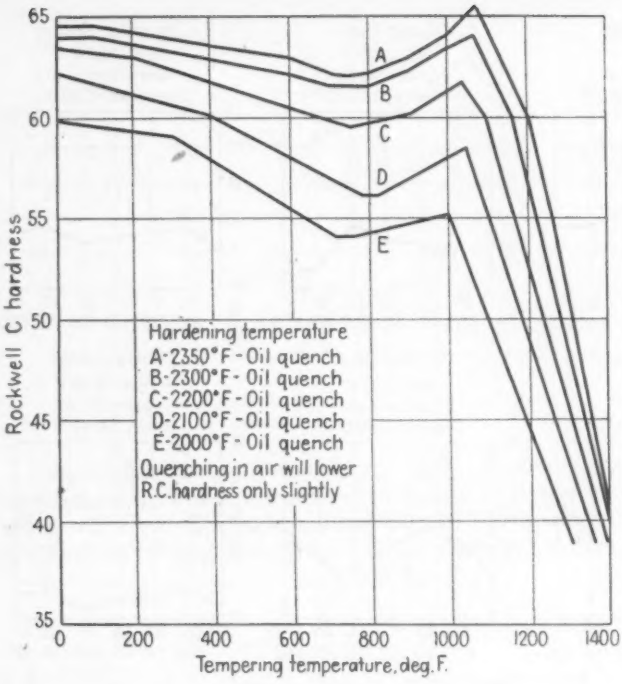


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FIG. 3 — Rockwell hardness of "triangle" 1 and 2 high speed tool steels.

Heat treatment H-T	Ultimate strength av. p.s.i.	Rockwell C hardness	Compressive strength p.s.i.
O.Q. 2250°/500°F.	79,475	61	397,500
O.Q. 2250°/800°F.	77,925	60	389,500
O.Q. 2250°/1100°F	77,600	59	388,000
O.Q. 2300°/500°F.	81,175	62	406,000
O.Q. 2300°/800°F	81,475	62	407,500
O.Q. 2300°/1100°F.	82,575	62	412,500

Approximate Analysis
C 0.70 W 1800% CR 4% V 1.00% (CO 5-10% Opt.)

single process of cutting tool steel to the required length. For example, if a tool designer wishes to specify that a piece of tool steel, ¼ x 1 x 2 in. be used, he refers first to the chart to determine if the company stocks that particular size of steel under the desired code of tool steel. If not, he selects a size in stock that will fill the same needs. The charts list specifications for the approximate 1000 sizes standardized by Convair for use.

Three types of graphs were worked out for tool designers and heat treaters. Fig. 1 indicates the drawing temperatures of tool steels for maximum hardness and toughness under each coding of tool steel. Fig. 2 gives the impact test in foot pounds. Hardness values for high speed tool steels are charted in two separate graphs, Fig. 3.

Heat treating data, for all steels grouped into the five classifications, was worked out to insure, as nearly as possible, the use of the proper heat treating process. By taking the bulk of heat treating information supplied by tool steel manufacturers, it was possible to select appropriate heat treating instructions for the various codings. Taken into consideration, of course, was the knowledge that variations in heat treatment would occur. But as the new program of tool steel codes progresses, necessary variations are discovered. Noted carefully, they serve as fortunate examples for future reference.

The extensive use of cold rolled steel throughout Consolidated Vul-

BELOW

TABLE II

Conversion of Tool Steel Codes to Chemical Analysis

CLASSIFICATION		ELEMENT PERCENTAGE									
		C - CARBON SI - SILICON MN - MANGANESE CR - CHROMIUM				MO - MOLYBDENUM V - VANADIUM		CO - COBALT W - TUNGSTEN NI - NICKEL B - BORON			
GROUP	C.V.A.C. DESIGNATION	C	SI	MN	CR	MO	V	CO	W	NI	B
1	CIRCLE 1	0.18 0.25	0.10 0.30	0.30 0.50							
	CIRCLE 2	0.45 0.55	0.10 0.30	0.60 0.90							
	CIRCLE 3	0.85 1.00	0.20 0.20	0.20 0.20	0.25 OPT.		0.15 OPT.				
	CIRCLE X	1.50	0.75 0.85	0.40		0.25					
2	DIAMOND 1	0.90	0.25	1.60 1.75							
	DIAMOND 2	0.90	0.25	1.10 1.20	0.50				0.50		
3	SQUARE 1	0.50	1.00 1.80	0.40 0.70		0.40 OPT.	0.13 OPT.				
4	ELLIPSE 1	1.50	0.20	0.20	12.00	0.80 1.00	0.25				
	ELLIPSE 2	2.25	0.20	0.20	12.00	1.00	0.25			0.50 OPT.	
	ELLIPSE 3	0.90	0.20	0.20	1.35 1.60	0.08 OPT.				0.35 OPT.	
5	TRIANGLE 1	0.70 0.80			4.00		1.00 1.50		18.00		
	TRIANGLE 2	0.70 0.80			4.00 4.50	1.00 OPT.	1.00 1.75	5.00 12.00	18.00 18.50		
	TRIANGLE 3	0.70 0.80			4.00	4.00 4.75	1.50 2.00		5.50 5.75		
	TRIANGLE 4	0.70 0.80			4.00	4.00 4.75	1.50 2.00	5.00 8.00	5.50 5.75		0.25 OPT.

tee, prior to adoption of the coding system, serves as an excellent example of the effectiveness of the new program. Cold rolled steel bears a Group 1 "circle 1" code. Contrary to former practice, Convair now discourages the use of this low carbon steel for tools. The steel formerly was used to a great extent for blanking dies because of its easy machinability. It is included in the code classifications in order to separate the material from tool steel groups and to avoid shop confusion.

The carburizing of this steel results in high warpage and a low strength tool. Cold rolled steel is used for short runs, but no longer is it used for high production blanking dies. The steel is carburized either by pack hardening or by liquid carburizing. Surfaces that do not require the carburizing treatment are shielded by a copper resistant paint.

According to Group 4, Table I codes "elipse 1 and 2," high carbon, high chromium punch and die steels should be used for blanking dies. The brevity and usefulness of data compiled for heat treaters may be emphasized by quot-quoting from instructions regarding "ellipse 1 and 2":

Properties: High wear resistance; low toughness; low warpage; high hot hardness; deep hardening; high compressive strength.

Uses: High carbon, high chromium punch and die steel is a high production die steel that hardens satisfactorily in air ("ellipse 1"). Its wearing and cutting capacities are considerably better than those of dies made of carbon or oil hardening steels. "Ellipse 1," the air hardening type, is tougher and deforms less in hardening than "ellipse 2." It is used for cutting and forming dies such as lamination, trimming, blanking, stamping, cold forming and extrusion.

Heat treatment: The air hardening type die steel is a safe steel to harden. Very little distortion results from heat treatment, permitting accuracy in the finished die or tool. It is necessary, however, to protect the surface from decarburizing in the hardening operation. Surface decarburizing can be prevented by pack hardening or by controlled atmospheric furnaces. High carbon, high chromium steel *absorbs heat very slowly* and requires considerable time to effect complete solution of its carbides. For this reason, it must be pre-heated more slowly and held longer in the hardening heat than other steels. Therefore, pack hardening or salt bath hardening is recommended to give uniform and satisfactory results.

GROUP - 2
DIAMOND - 1

OIL HARDENING DIE STEEL
(NON-DEFORMING)
HOT ROLLED BAR STOCK

COLOR CODE: MAT'L. CODE: ◇1 T.S.

● ACTIVE STOCK — ROUND SHAPE DIAMETER — INACTIVE STOCK

1/4		5/8		1	●	1 1/2	●	2	●	3	●	4		6	
5/16		11/16		1 1/8		1 5/8		2 1/4	●	3 1/4		4 1/2		6 1/2	
3/8	●	3/4	●	1 1/4	●	1 3/4	●	2 1/2		3 1/2	●				
7/16	●	13/16		1 3/8		1 7/8		2 3/4	●	3 3/4	●	5		8	
1/2	●	7/8	●									5 1/2		8 1/2	
9/16	●	15/16													

SQUARE & RECTANGULAR SHAPE — THICKNESS

WIDTH	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	7/8	1	1 1/4	1 1/2	1 3/4	2	2 1/2	3	4
1/4																	
1/2						●											
3/4								●									
1					●	●	●	●		●							
1 1/2								●				●					
1 3/4																	
2					●	●	●	●		●		●		●			
2 1/2								●					●				
2 3/4												●					
3					●	●		●		●	●	●	●	●		●	
3 1/2											●	●					
4						●		●		●	●	●		●		●	●
4 1/2											●	●					
5										●	●	●					
5 1/2											●	●					
6			●	●			●	●		●	●	●		●			
8										●	●	●					
10											●	●					
12											●						

FIG. 4—One of the 14 charts listing active stock, by specifications, for all tool steels stored by Consolidated Vultee.

Operations	Temperature Range deg. F.	Resulting Hardness Approx. Rockwell C
Forging	1900-1700	—
Annealing	1650-1700	15
Pre-heating	1200-1300	—
Hardening in Air	1825-1875 "Ellipse 1"	63-64
Hardening in Oil	1800-1850 "Ellipse 2"	63-64
Drawing	300-1000	64-60

With new heat treating instructions determined for all given types of steel, the use of improper heat treating equipment would have nullified the entire tool steel program. In order to round out the program, Convair modernized the tool steel heat treating department. The open hearth batch-type furnaces were replaced with five new salt bath furnaces: high

KIND OF TOOL	STEEL RECOMMENDED		QUALITIES WANTED IN TOOL	HARDNESS ROCKWELL-C
	1 ST.	2 ND.		
ARBOR NUTS, MILLING MACHINE	□1	②2	FAIR HARDNESS GREAT STRENGTH	45-52
ARBORS, MILLING MACHINE	□1	②2	FAIR HARDNESS GREAT STRENGTH	52-55
ARBORS, LATHE	③3	□1	VERY HARD	60-63
BORING BARS	□1	◇1	FAIR HARDNESS GREAT STRENGTH AND TOUGHNESS	42-46
BROACHES	△3	◇2	MAX. HARDNESS NORMAL DISTORTION BEST CUTTING EDGES	62-64
BROACH ADAPTERS	□1	③3	FAIR HARDNESS MACHINEABILITY	46-50
BUSHINGS, GUIDE	③3	◇1	HARD WEARING SURFACE NORMAL DISTORTION	62-64
BUSHINGS, DRILL	③3	◇1	HARD WEARING SURFACE NORMAL DISTORTION	60-62
BUSHINGS, SCREW TYPE	◇1	①1	HARDNESS WEAR RESISTANCE MIN. DISTORTION	60-62
BUTTONS, LOCATING	③3	◇1	VERY HARD	60-62
CENTERS, LATHE	◇2	△3	VERY HARD	60-63
CHISELS, COLD CUTTING, HAND OR PNEUMATIC	□1	◇2	SHOCK RESISTANCE WEAR RESISTANCE	EDGE-53-55 SHANK-42-48
CLAMPS	③3	□1	FAIR HARDNESS. GREAT STRENGTH	46-52

TABLE III
Applications of Tool Steels

speed or high heat, with a temperature range of 1900 to 2350 deg. F.; quenching unit, with a temperature range of 1000 to 1300 deg. F.; preheat, which operates up to 1600 deg. F.; and two draw furnaces which operate up to 1350 deg. F.

Heat Treating in Liquid Baths

The advantage of using liquid baths for the heat treatment of tool steels is that the very nature of the bath is such that the air is excluded during the heating cycle, thus preventing oxidation. Likewise, during the brief interval of transfer of parts from the salt bath to the quenching media, the molten salt adheres to the piece, excluding the atmosphere and preventing oxidation or scaling in the transfer of the piece to the quench. The quenching media, or wash tank, removes this salt film and the surfaces are left clean, or cleaner, than before hardening.

For this reason, it is hoped that parts, in the future, may be finish-machined and ground prior to hardening, realizing full skin hardness. With the open-type furnaces, it was necessary to rough-machine the tool first and to finish-machine or grind after heat treatment. This procedure was costly and inefficient from several standpoints.

In a salt bath tools come up to a temperature more rapidly, due to the fact that the heat transfer of a liquid bath is several times that of air. The temperature of a salt bath can be controlled more carefully, inasmuch as salts have a high specific heat, and fluctuation in the furnace temperature is negligible.

The instrumentation of these furnaces is of the latest electronic type. The high speed unit is equipped with a rayotube pyrometer. Under the old procedure, many tools were ruined by heat treating and had to be remade, wasting valuable skilled labor, material and money.

Since adoption of the tool steel program throughout Convair, one of the tool rooms at the San Diego division has been using the "diamond" code steel for five months in making dies. Not one failure in service has resulted with the use of this steel. The ideal standard of quality in this die steel is obtained when it is heat treated to a Rockwell C hardness of 60 to 61. It holds up in service, per grind, five to 10 times as long as the type of steel used formerly. The old-type steel was heat treated to a Rockwell C hardness of 55, in order to have enough toughness in the tools to prevent them from breaking in operation. The "diamond" steel is tougher at 60 Rockwell C hardness than the other is at 55 Rockwell C hardness.

The tube bending department was having considerable trouble with beading ¼-in. tubing. The beading tools, made by the company, would give a maximum tool life of 100 pieces per tool. Twelve of these tools were made up in the tool room out of code "square 1" steel. Two of the tools, made from "square 1," were put into service and have beaded 35,000 pieces and still are holding up.

A series of experiments was carried out in nitriding high speed tools, such as taps, slitting saws and fish-mouth cutters. Results of the experiments showed a phenomenal success in improving the cutting efficiency from 100 to 500 per cent. Nitriding saws, supplied to the machine shop, have produced 250 to 300 parts, as against straight commercial saws producing 60 to 80 parts before having to be replaced. In nitriding thread taps, one tap, properly heat treated and ground, has produced over 200 parts, without use of a rough tap. Previously, 40 to 50 parts was the limit for a finish tap, used with the rough tap.

▲ ▲ ▲

Production Short Cuts at Douglas

ABOVE

EDGE distance guide for a spot welding machine. The guide is easy to set up, readily adjustable and 12 of them will save 6 hr. per day over the method previously used.

LEFT

DOUGLAS AIRCRAFT CO. gave Walter McGarvin a top award and $150 for his idea of sponge backed fibre board stencils which replace the use of individual gummed stencils. This resulted in a great reduction in time and materials. The stencil may be used 85 to 100 times.

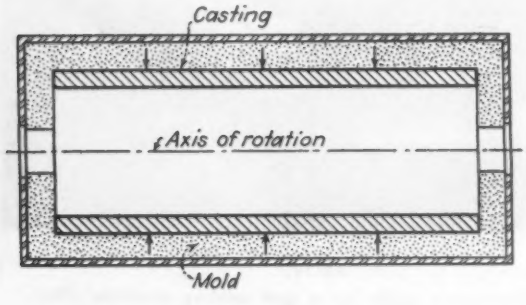
o o o

RIGHT

AN efficient automatic air-clamp for drill presses won $100 in War Savings Stamps for W. Atherton. The mechanism allows use of a drill and spotface, or rear and spotface, thus eliminating one drill operation. Below the drill table in the photo is located an air pressure chamber to which is attached two holding prongs which hold angle stock to be drilled. As the feed lever is turned, the air pressure is synchronized to enter the air chamber with timed action. Air pressure clamps the material to be drilled tightly in place. As the drill moves upward the air pressure is released and the stock may be moved to the next position for drilling.

Centrifugal Casting

THE process of centrifugal casting is used for the production of many different types of castings and for varied reasons. Castings of a wide variety of configurations can be centrifugally cast including: Gear blanks, sheaves, sprockets, cylinder liners, bearings, bushings, valve bodies, fittings and a wide assortment of odd-shaped castings. One interesting development of centrifugal casting which has gained considerable impetus during the last few years is called precision casting, whereby it is possible to produce small castings accurately controlled as to size and which require little or no further machining before final assembly. Due to the thin sections involved, centrifugal casting is used. The forces which are obtainable through the process of centrifugal casting permit metal to flow into thin sections which otherwise would be very difficult to cast.



LEFT

FIG. 1—Sketch of true centrifugal casting, produced by spinning the casting about its own axis.

o o o

BELOW

FIG. 2—Sand mold for centrifugal casting.

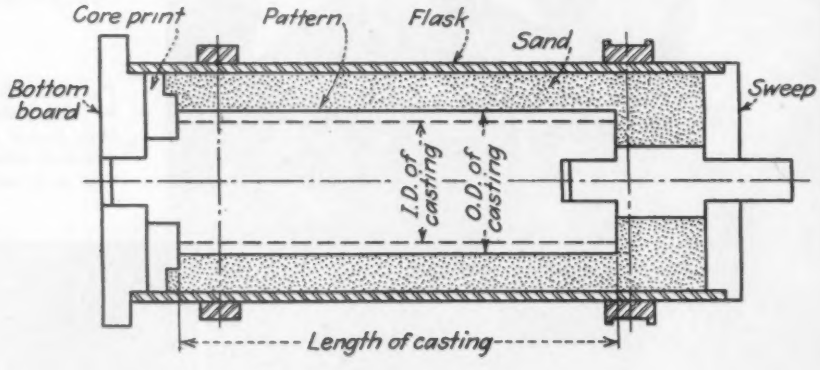
The requirement for aircraft engine bearings of exceptional cleanliness has resulted in the use of centrifugally cast bearings which successfully pass X-ray inspection with an extremely low percentage of rejections. The lack of sufficient forging capacity in recent years has created interest in centrifugal casting which otherwise would not have been present. Many of these new applications for centrifugal casting have been found to be very economical and will persist in the postwar period.

Centrifugal castings are divided into three different types. The first is true centrifugal casting, such as bushings and liners, and an example is diagrammed in Fig. 1. The second is semi-centrifugal casting and is represented by odd-shaped castings which are spun about their own axis but which have cooling in two directions rather than uni-directional cooling. The third method is called the pressure method of centrifugal casting or centrifuging. Using this method the castings are generally arranged about the center of rotation as the spokes of a wheel.

The equipment used in centrifugal castings falls into two general classes: Machines which rotate the molds about a vertical axis and machines which rotate the molds about a horizontal axis. Vertical centrifugal casting machines are generally used when the diameter of the casting is large as compared with the length, or when the semi-centrifugal or pressure method of centrifugal casting is used. The metal yield obtainable from castings made by these methods will vary between 60 and 100 per cent, depending upon the type of casting and the casting requirement for gates.

Castings produced in a horizontal centrifugal casting machine are usually long as compared with the diameter and are generally termed true centrifugal castings. The metal yield obtained approximates 100 per cent. However, this type of centrifugal casting can be applied only to castings whose bores are cylindrical in shape. The external contour of true centrifugal castings does not necessarily have to be cylindrical in shape but must be nearly so for ease in molding. True centrifugal castings may be produced on vertical axis machines as well as on horizontal machines.

A true centrifugal casting is one essentially cylindrical in shape which is produced without a center core and in which the direction of solidification is from the outside of the casting towards the axis of rotation. A thorough understanding of this definition of a true centrifugal casting is of tremendous assistance in eliminating any troubles or defects which may arise in the production of this type of casting.



Sand or Permanent Molds Used

Sand molds or permanent molds may be used for centrifugal casting. The selection of the type of mold is determined by the shape of the casting, the quality desired and the production required. Sand molds, shown in Fig. 2, are used when the outside shape of the casting has an odd configuration which does not permit the use of a metal mold, or when only a few castings of the particular size

Methods . . .

By NATHAN JANCO
Centrifugal Casting Machine Co., Tulsa, Okla.

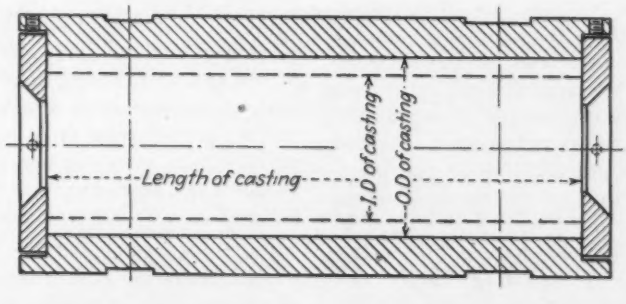
. . . Good centrifugal castings depend on the molds, pouring procedures and spinning speeds employed. What methods to follow and how to eliminate casting defects are herein discussed. For other recent articles on centrifugal casting, see The Iron Age, issues of April 1 and 22, May 13 and 20, and Dec. 2, 1943.

are to be made. The sand molds may be skin dried, but generally dry sand molding practice is used. The sand molds can be produced on a bumper or by ramming, or a combination of both methods. A refractory type wash is applied to the mold surface either before or immediately after drying.

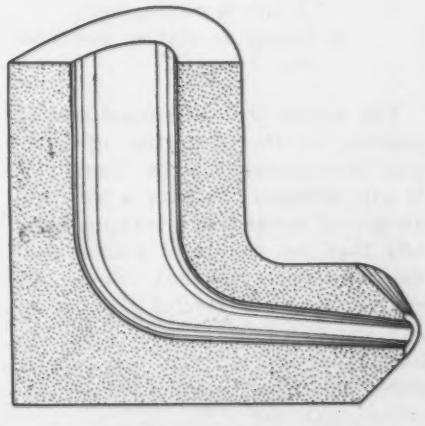
The permanent molds may be made of iron, steel or graphite. The most generally used material for permanent molds is an alloy cast iron of 50,000 lb. per sq. in. See Fig. 3. It is very important that the mold castings be perfect and free of all casting defects. The molds are machined overall to obtain a smooth surface on the portion where the casting contacts the mold and elsewhere to insure dynamic balance. If there are any casting defects on the portion of the mold which contacts the casting, it will be extremely difficult, if not impossible, to remove the casting from the mold. Generally, the use of a refractory type wash will considerably increase the life of permanent molds. The method of application of the wash is of considerable importance as care must be taken that the wash is sprayed uniformly. The molds are generally preheated to a temperature of 300 to 400 deg F. and then sprayed with a wash forming a layer approximately 1/32 in. thick. The purpose of this preheating of the mold is to dry the wash and make it adhere to the mold surface in an even coating. If the mold is preheated to too high a temperature, the wash will not adhere to the mold surface. It is also generally desirable that the mold be hot when the metal is poured into it to eliminate the possible presence of any condensed water vapor which could cause casting defects. In some cases it is necessary to preheat molds to somewhat higher temperatures in order to prevent the occurrence of laps or cold-shuts. Many types of castings which would have to be made in sand molds statically can be made with resulting economy in metal molds by centrifugal casting.

The metal is generally poured into the molds at a somewhat higher temperature than that used for the same casting if poured statically. This is particularly true when metal molds are used. The pouring rate is important and must be given consideration. When the metal is poured into the mold it must quickly cover the entire mold surface, else cold-shuts or laps will occur. As soon as the entire mold surface is covered with metal, it is then desirable to slow down the pouring rate to assist the casting in the process of directional solidification. A rough practical criterion of pouring rate for sand molds would be 5 to 10 lb. per sec., and for metal molds 8 to 15 lb. per sec. Large diameter molds require still higher pouring rates. A satisfactory procedure is to pour the first half of the metal at a high rate and then reduce the pouring rate to about half that amount for the remainder of the metal poured. It is important, of course, that the metal stream never be broken after the pouring procedure is once commenced. In horizontal casting a runner pot, Fig. 4, is generally used. This permits the ladle men to pour down into a hole since the runner pot has a nozzle which extends into the end of the mold. The pouring rate can be adjusted by using different sizes of nozzle openings.

In horizonal casting particularly, the speed of rotation required is a function of the ability of the mold to "pick up" or accelerate the metal to the spinning speed. This means that a mold having a rough surface will require a lower spinning speed than a mold having a very smooth surface. General practice in horizontal centrifugal casting is to spin sand molds at speeds from 60 to 75G, and metal molds from 40 to 60G. For



ABOVE
FIG. 3—Metal mold for horizontal centrifugal castings.



RIGHT
FIG. 4—Runner pot used in horizontal casting. Nozzle of the runner pot extends into the end of the mold and the pouring rate can be adjusted by varying the size of the nozzle opening.

example, an 8 in. diameter casting would be rotated at 75G or 810 rev. per min., as shown in Fig. 5. A bushing whose length is less than twice its inside diameter would generally be poured in a vertical machine and spun at 75G. If longer bushings than this are cast in a vertical machine, the amount of taper of the inside diameter becomes commercially excessive. However, for relatively short bushings, the amount of taper obtained is negligible.

Although the most convenient method of determining the proper

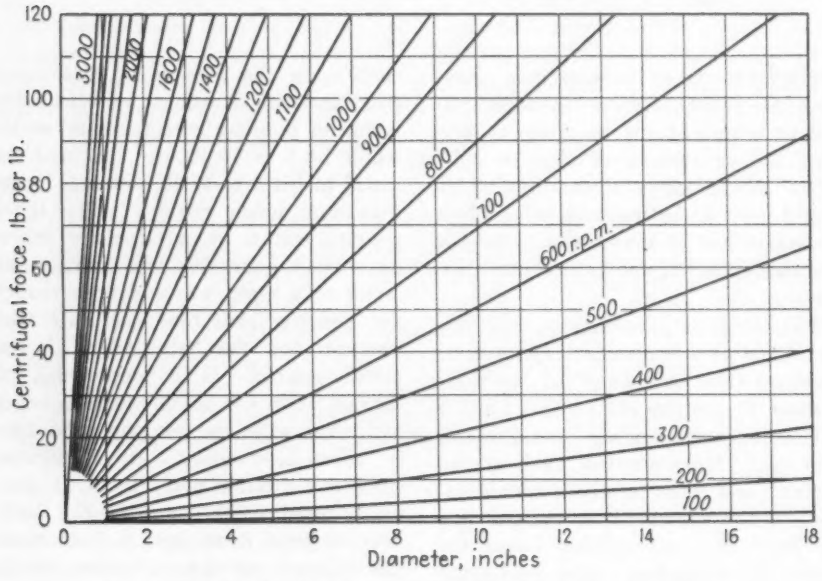


Fig. 5—Relationship between spinning speeds and size of castings.

speed for horizontal centrifugal casting is the graph, shown in Feg. 5, having diameter as its abscissa and G, or centrifugal force in lb. per lb. as ordinate, the following formula may be used in calculating spinning speed:

$$G = 0.0000142\ d\ N^2$$

where G is centrifugal force in lb. per lb. or number of times gravity
d is the diameter in inches of the revolving body
N equals revolution per minute.

The use of the centrifugal casting process for the production of bushings is extremely simple. Usually it is only necessary to pour a weighted amount of metal into a rotating mold and then let the mold rotate until the metal has solidified. Since this method does not involve the use of any gates or risers, it is quite unlikely that bad castings will be produced unless bad metal is poured into the mold, or the casting is poured short.

Casting Defects

A number of defects occur in centrifugal casting which may or may not occur in static casting. A discussion of these defects, their cause and suggested methods of their elimination follows.

In a horizontal machine, if the mold is rotated at too low a speed, or if the metal is poured into the mold at too high a pouring rate, "raining" will occur. It will be noticed that the metal will actually rain or fall from the top of the mold to the bottom. In order to witness this phenomenon of "raining" it is necessary to look into the opposite side of the rotating mold from which the metal is poured. This "raining" occurs because the molten metal has not been accelerated to the speed of rotation of the mold. If the friction of the molten metal against the mold wall is low due to too smooth a mold surface, or because of too low a spinning speed, the molten metal will not reach a high enough rotative velocity to overcome the force of gravity and will fall off the roof of the mold. If the metal is at too high a temperature when entering the mold, its viscosity will be low and will be more difficult to accelerate quickly to a high enough rotative velocity to overcome the force of gravity. This can be remedied by a higher spinning speed, or more easily, by reducing the pouring rate, particularly the pouring rate of the last half of the metal poured into the mold. The bad effect of this "raining" is that it oxidizes the metal "raining" from the roof of the mold and cause a bad casting, or more usually an excessive amount of dross on the inside diameter of the casting. The "raining" causes turbulence of the metal in the mold and can upset the temperature gradient of the molten metal and, thus, prevent directional solidification.

If longitudinal cracks occur in a casting, they can be remedied by reducing the spinning speed. These cracks are caused by the hoop stress set up by the centrifugal force. This stress will cause a crack or hot tear when it exceeds the strength of the casting. As many metals have a relatively low tensile strength immediately after cooling, it is to be expected that cracking can occur. It must be kept in mind, however, that in order for the crack to occur the casting must actually contract and become smaller in outside diameter than the inside diameter of the mold. Of course, this occurs in all ferrous and most non-ferrous metals.

Circumferential cracks always occur on long castings which have a flange at both ends unless particular care is taken with the composition of the molding sand. The flanges at each end of the casting prevent longitudinal contraction of the casting after solidification. The molding sand should have relatively low hot strength so that it will permit the casting to contract after it has solified. Nothing in the centrifugal casting method causes this type of defect. It is the same defect which occurs in this type of casting in static casting practice, and the same precautions should be taken as in static casting. Castings made with a flange at one end will usually not be troubled with circumferential cracks, as the casting is restricted from longitudinal movement at only one end and is free to contract from the end without a flange.

Pit holes on the outside surface of a casting are usually caused by water or volatile matter present in the mold surface or in the molding sand. They can be eliminated by the use of the proper sand mix, venting holes in the flask and thorough drying procedure. Volatile matter contained in the wash can also cause this type of defect.

Pits or shrink holes on the inside of a casting may occur if the proper conditions necessary for directional solidification from the outside toward the axis of rotation do not exist. Many contributing factors may cause this type of defect. The mold may be

too hot, in which case a colder mold should be used. Air circulation through the bore of the casting can permit cooling of the inside of the casting at too high a rate, thus upsetting directional solidification. This can be remedied by reducing the size of the end openings of the mold. If the casting wall is too thick, this type of defect can also occur, as directional soldification will be upset, because it may be impossible to obtain adequate heat absorption by the mold at a high enough rate. Thicker walled castings can be produced by using metal molds than can be made in sand molds. The metal molds will absorb the heat from the casting at a very much higher rate than the sand molds and thus favor the directional solidification process. Thick walled castings can sometimes be more readily produced by considerably reducing the pouring rate of the last half of the metal poured. This gives the mold a greater length of time to absorb heat from the metal immediately adjacent to the mold surface. The introduction of an insulating material or pipe eliminator into the bore of the casting after pouring is often of considerable benefit. In extreme cases it is sometimes necessary to introduce an exothermic type of pipe eliminator.

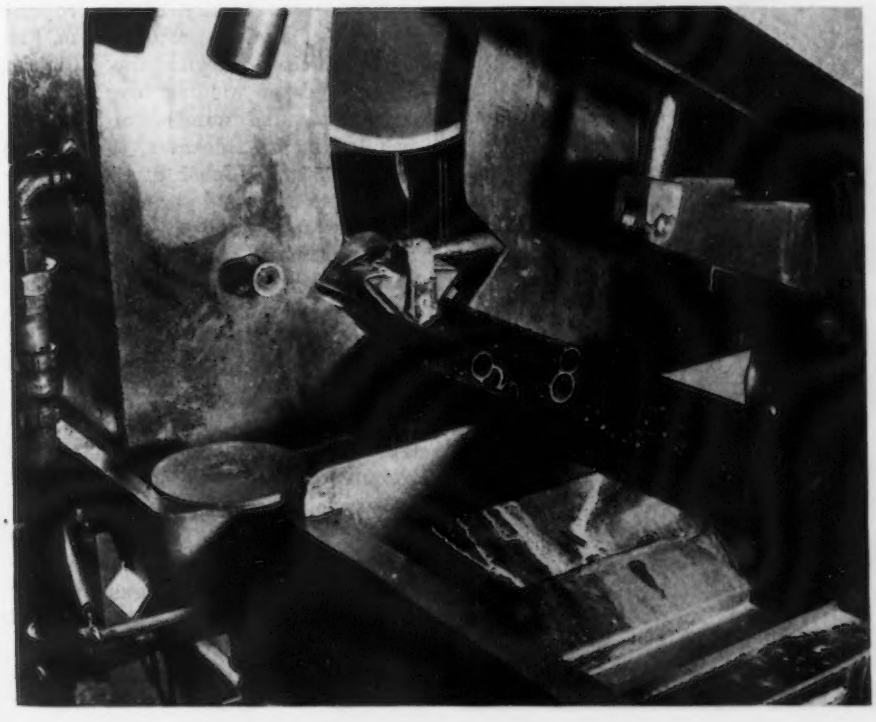
The above discussion refers generally to both ferrous and non-ferrous metals, although some of the defects which occur apply most particularly to non-ferrous metals, while others to ferrous metals. If the definition of what a true centrifugal casting really is is kept in mind when trouble shooting, it will be of great assistance in eliminating defects which may occur. From the foregoing it should not be assumed that the centrifugal casting process is difficult or that the various troubles are frequently encountered. Actually, many foundries have produced many centrifugal castings without ever producing any bad castings or encountering any difficulty whatsoever.

Multiple Cutting of Tubing

USE of a plain wooden block, cut in the shape of a V, bound on the sides by a piece of canvas and topped off with a snap fastener, has speeded up tube cutting anywhere from three to 25 times, (depending on the tube size) at the Consolidated Vultee Aircraft Corp., San Diego, Cal. Shortly after the installation of a water-cooled, abrasive cut-off machine, it was found that its speed was not sufficient to meet production schedules. As designed, the machine could take care of cutting only one piece of steel tubing at a time.

It remained for Dale Blast, the operator of the machine on the swing shift, to find the answer for greater production. He designed the V-clamp, illustrated, to replace the original clamp that came with the machine. Two fingers on either side of the saw support a V which in turn firmly clamps the tubes to be cut in a V-like trough made from a structural angle. Production was thus stepped up to such an extent that at the present time the hazard of running behind schedule in the steel tube and bar stock cutting requirements has been eliminated entirely.

HERE is shown how the V-block holds five 1-in. tubes tightly in place for the abrasive cutting operation. Steel fingers on each side of the saw support the blocks that firmly clamp one or several tubes in the V-shaped cutting trough.



In comparison with the original capacity of the machine, that of cutting one piece at a time regardless of size, the following table shows the actual number of pieces now cut per size at one cycle of operation without creating an overload, since the abrasive cutting disk is automatically fed:

Tube Size In.	Loading Capacity Pieces
¼	25
⅜	15
½	13
¾	9
⅞	7
1	5
1¼	5
1½	3
2	3

The table shows that by using the V-clamp holding device, production of steel tube cutting has been increased from three to 25 times over the machine's original capacity.

Aluminum Welding

By STANLEY H. BRAMS
Detroit Editor, The Iron Age

o o o

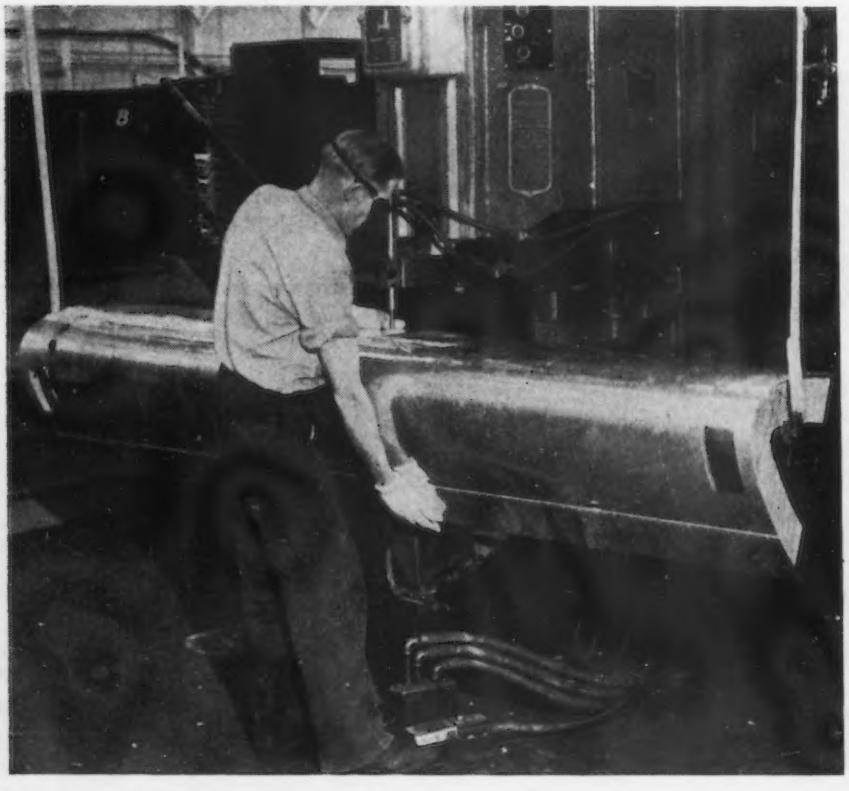
ALMOST from the moment they first thought about building B-24 bombers, Ford Motor Co. officials were highly intrigued with the possibilities of time-saving by welding airframe parts rather than riveting them. A persistent attitude, events have demonstrated, has been a necessity in such a campaign. A great many of the obviously easy applications (from a production viewpoint) were not approved by Air Force design handbooks, and approvals were granted only to such proposals as met A.A.F. requirements.

Nevertheless, the engineering approach to these applications was sound enough that welding has now replaced riveting on many parts, making possible a saving of 90 manhours per plane — no inconsiderable time. As originally designed, the Consolidated Liberator utilized 13 rivets for each spot weld. This proportion on the Ford-built Liberators stood several months ago at 8.5 to 1, and today is still lower.

Several phases of the Ford welding program are intensely interesting—for example, the extreme care which has been specified for maintenance of electrode tip contours, the viewpoints on refrigerated electrodes and the methods which have been and are still being developed to prove that welding can be used for certain applications not ordinarily approved by Army Air Force restrictions.

The Ford people decided, to begin with, that welding substitutions are best made on parts which are not subject to maximum vibration and which are subject mainly to direct shear. Generally these parts are small, but some sections now welded measure around 11 ft. in length by 24 in. or so in width, such as the center wing leading edge, Fig. 1. Due to complications in handling parts which must be fabricated in fixtures, a general attempt has been made to limit welding to units which can be held together with Cleco fasteners. This limitation is seldom a problem, because Air Forces specifications require the use of stop rivets at the ends of a row of spot welds, and rivets are often used at frequent intervals in long rows of spot welds. During fabrication, the rivet holes can accommodate the Clecos.

FIG. 1—One of the largest sections of the B-24 bomber welded at Willow Run is this center wing leading edge. Time saved by welding over riveting is 4 hrs., 34 min. per ship.



Getting Proposals Approved

Study is continuous on selection of parts suitable for welding. When one such is chosen, a brief proposal for spot welding is drawn up. The first section of this proposal is a photograph of the part involved, Fig. 2. For purposes of easy visibility in the photograph, the part is prepared for the camera with cloth masking tape over the welding areas, marked with a "$" at each spot to be welded.

The second portion of the proposal consists of a mimeographed form, Fig. 3, on which is recorded the estimated advantages of welding over riveting. The name and number of the part is filled in, its thickness, the fixtures required, the number of rivets eliminated per part and per ship, the time required for an all-riveted assembly, and the time for a riveted and welded assembly (spot rivets are usually specified at the end of rows of spot welding). Analysis of these facts shows time saved per ship by welding.

Once approved by the prime contractor for production, the parts are rerouted to the welding department for assembly.

The great share of weld fabrication at Willow Run is on resistance welding machines, although gas and arc work is also undertaken. Stored energy resistance welders are largely used. These are arranged to permit handling of bulky pieces without inter-

At Willow Run . . .

. . . Ford is an advocate of spot welding aluminum sheet wherever feasible. Placing emphasis on proper cleaning and regular electrode maintenance, the Bomber Plant has worked all-purpose cleaning solutions and an electrode dressing device that help maintain high weld quality above the minimum AAF shear values. Refrigerated tips are not favored.

fering with work at other machines, Fig 4.

A great deal of thought has been devoted to the preparation of parts at Willow Run. Wire brush cleaning is utilized where physical arrangements of production lines make the use of dipping tanks impractical from a time and location standpoint. But wherever parts can be brought to a central platform without impairing manufacturing progressions, chemical cleaning is utilized. Ford prefers the chemical cleaning for production reasons, seeing it broadly as a medium for removing the surface oxide from many parts at one time regardless of size and contour of parts. The chemicals used leave an oxide film on the surface but if parts are properly cleaned the electrical surface resistance will be uniform, thus helping to insure weld quality.

Cleaning Cycle

Four chemical cleaning departments are installed at Willow Run, Fig. 5. All handle a considerable variety of parts in a variety of alloys, and so it was deemed desirable to utilize solutions which would be generally applicable to all. Admittedly this all-purpose formula cannot be as satisfactory as specialized cleaners on some applications but Ford engineers figure it has definite advantages in overall use.

The first of the five cleaning steps consists of degreasing in a soap solution which, like the other liquids, is contained in a 550 gal. tank. Parts are left in this tank for an average of about 2½ min., although immersion may run as high as 5 min., depending on the thickness of the part. The solution, held at 190 deg. F., consists of 3⅓ oz. methylsilicate, 2/3 oz. borax and ¼ oz. nacconol (a wetting agent) per gal. of water.

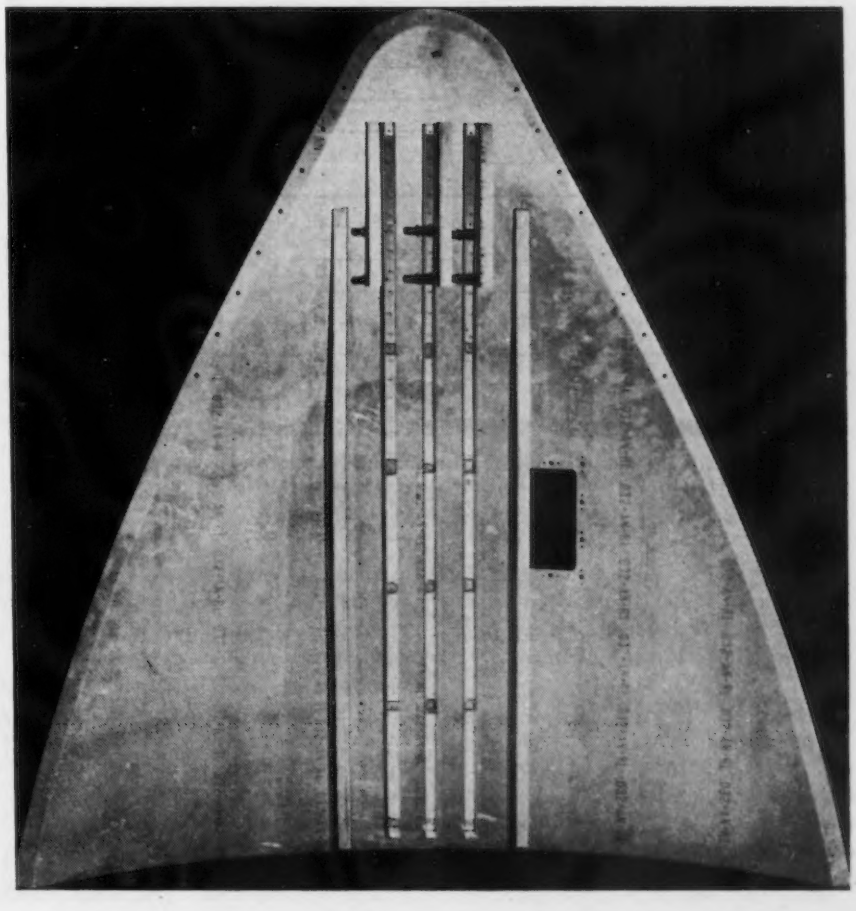
A cold water rinse follows. Time, of course, is not critical here; the parts are removed simply in sequence with other steps of the cleaning. The cleaning operator must see only that there are no "water breaks," that is, areas from which, on removal from the tank, the water withdraws by capillary action rather than gravity flow.

Actual cleaning follows in the third tank, where a sulpho-chromic solution developed by Ford is utilized. It consists of 3/5 lb. of chromic trioxide and 1 gal. of concentrated commercial sulphuric acid to 10 gal. of water. This solution is mildly reactive on the aluminum, but so slowly that it is not a factor. It is held at a temperature of 170 to 185 deg. F., and parts are immersed in it for 5 min.

A cold water rinse follows in flowing water, with the part withdrawn through a mild spray to eliminate any surface scum. Each piece then goes to an open side cabinet where it is held under hot air current until dry.

The solutions are tested once or twice daily, depending on use, titrat-

FIG. 2—The first section of a spotwelding proposal made to the prime contractor consists of a photograph of the part involved, in this case a fairing installation over the stabilizer. Before photographing, strips of cloth masking tape were set over welded areas of the part and marked with a "$" at each spot, increasing visibility in the photograph.



ed for total acidity and then checked with a potentiometer for active acidity. If a solution is found weak, it is strengthened. If contaminated it is discarded.

Ford tests indicate that parts going through this cleaning process can rest untouched from three to five days without suffering effects which would impair weldability, providing of course that weld controls are adjusted accordingly. However, Willow Run practice is to utilize during each shift all aluminum cleaned in that one shift, so no metal is held more than 8 hr. and most of it is used at once.

Electrode Control

The resistance welding department utilizes R.W.M.A. Class 1 cadmium copper alloy electrodes. These are machined by Ford, using a taper with an 8 deg. included angle. Willow Run finds this angle suitable for easy removal of electrodes from their holders.

Electrodes used on flat surfaces are shaped to a 3 in. spherical radius. For curved edges, 4 in. radius is used on the outside surface and 2½ in. radius is specified for the concave side. Such curved parts as the wing leading edge utilize this combination of sizes.

Ford technicians regard these dimensional requirements as definitely critical to provide best and most economical welding results. Their viewpoint is that they have invested substantial sums in machines to provide precise heat and pressure controls, and that having done this, they should provide the very inexpensive safeguard of also maintaining tip contact contour and area.

Frequent electrode resurfacing is therefore specified at Willow Run, not only to eliminate aluminum pick-up but also to maintain proper spherical tip contour. For this maintenance, Ford engineers designed a point cleaner, Fig. 6, which has since been considerably utilized at other plants. The tool is simply a strip of steel, to which can be fitted tool steel inserts, ground on both sides to spherical dimensions exactly matching the contours specified for tips. Emery cloth is wrapped around the insert, which is then placed between the electrodes. When the electrodes are brought to operating position the emery cloth is pressed to the contours of the insert. The tool is then turned between the electrodes, resurfacing them to the exact contours sought.

Electrode tips used on thin material are resurfaced every hundred spots or so. On medium material, 0.030 to 0.040 in., resurfacing is at the rate of once every 40 to 50 spots. On heavy material, like 0.091 in. gage, resurfacing takes place every 12 to 15 spots. For the most part these cleaning cycles come at the completion of welding of one part or one section of it, so the operators perform almost by rote.

Form B-904
Revised 12-1-42
Dept. 931

SPOTWELDING PROPOSALS

PROPOSAL # 34

Name Fairing Over Stabilizer — Part No. 32 T 271

Parts Affected	Stock Thickness
32 T 10271-8 R	.040
32 T 276-6 R	.040
32 T 276-6 L	.040
32 T 276-6	.032
32 T 10271-8 L	.040
32 T 10271-8 R	.040

Fixtures Required: Clecos

No. Rivets Eliminated per Part: 104 — Size: Q 4305-AD-4-4

Size:

No. Rivets Eliminated per Ship: 104 — Upset Weight: .00132 Oz.

Upset Weight:

No. Parts per Ship: 1 — Weight Saved per Ship: .13728 Oz.

No. Spot Welds per Ship: 110

Time: All Riveted Assembly: 90 Min.

Time: Riveted and Welded Assembly: 30 Min.

Time: Saved per Ship by Welding: 60 Min.

Proposed by: Welding — Dept.: 931 — Date: 12-30-41

Prints marked by: Engineering — Dept.: 921 — Date:

C.A.C. Action: Accepted — Genl.#: — Date:

Ford Engineering Drawing Change: — Date:

Release: — Prints Received:

Part in Production: Miscellaneous Assembly

Location for Production: B-40 — Date: 10-24-42

Remarks: In Production 8-2-43

L Bueter

FIG. 3—This is the second section of the proposal to spotweld the fairing installation shown in Fig. 2. Welding of this part saves 60 min. per ship over riveting, the data show.

Refrigerants Not Favored

Most electrodes used in the resistance department at Willow Run are cold water cooled. Engineers at the plant feel that the speed of their welding operations, combined with their accessibility to cold artesian well water, make unnecessary the use of electrode refrigerants.

As they see it, when spotwelding is at a rate of about 50 welds or higher per min., the recovery time between welds is insufficient to cool the electrode down to the temperature originally obtained by refrigerant. Each successive spot brings the metal into a higher temperature zone. Experiments undertaken at Willow Run, with refrigerant temperatures near 0 deg. F., demonstrated that at about the 20th spot on a 50 spot-per-min. rate, the temperature of the electrode had risen to the point where the refrigerant was not a great deal more effective than the artesian water obtainable at Willow Run.

Inasmuch as the Bomber Plant has an inexhaustible supply of such water, coming from the ground at 40 to 50 deg. F., most of the refrigerated electrode installations originally set up at Willow Run have been moved into subcontractor plants where cold water is not available or where operating speeds are slow enough to permit low temperature recovery.

The 60-odd cold water installations now at Willow Run are fed 5 gal. of water per min., coming to the ma-

FIG. 4—One part of the Willow Run welding department is shown. Broad aisles permit handling of bulky parts; table in center holds stock and completed parts.

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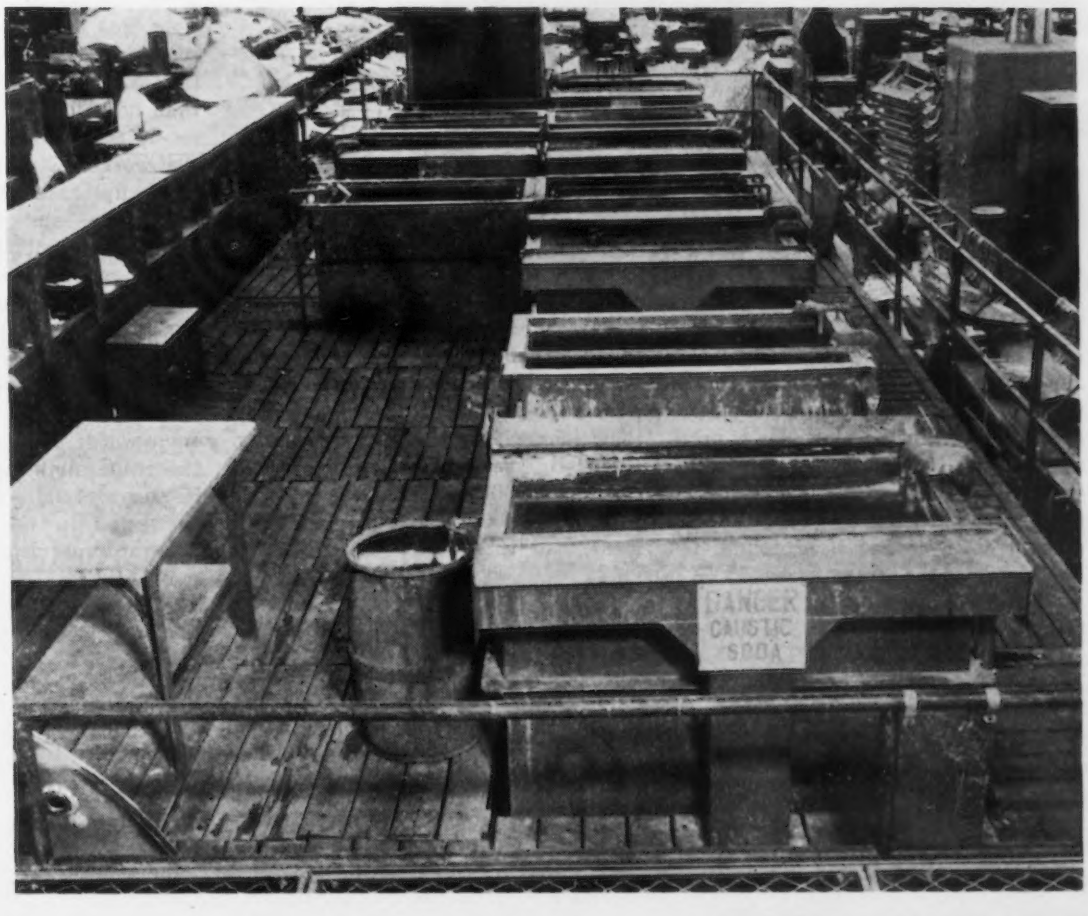


FIG. 5 — Shown is one of the five cleaning departments at Willow Run. These are on platforms raised about 5 ft. above the production floor so as to provide space for the downdraft underground suction ducts.

o o o

chines in two streams, one for each electrode of a pair. Originally a flow of 3 gal. per min. was employed, one stream supplying both the upper and lower electrodes, but the separate and increased flows are found an improvement.

Quality Control

Constant check on weld quality is maintained over each department and over all incoming parts of subcontractors. Specifications are held 25 per cent above Army shear strength minimums. This provides enough margin to maintain good shear values, and is not so high that cracks develop in the welds.

FIG. 6 — The ingenious tool used at Willow Run to resurface electrodes is shown being turned between tips by the operator. The tool itself, with die installed ready for use, is shown above.

Shear test coupons are run from each machine at the beginning of a run and at frequent intervals thereafter. If findings are below standard, the machine is shut down until satisfactory shear samples are made. One of the first things checked are the cleaning solutions. This is most quickly done, it has been found, by comparing results with findings on samples wire-brushed to a surface resistance level of 15 microhms.

Should the solution prove satisfactory the electrodes are replaced by a pair of known conductivity and hardness (all copper alloy bars are tested for conductivity and hardness). Stock may also be tested at this point to determine whether it meets specification.

Should all tests prove satisfactory to this point, the next step is to check the electronic panels. A special group of electronic experts maintain these panels at Willow Run, coming into their jobs with special radio training. Naturally these panels are subject to the same difficulties which confront radio sets—breakers out of adjustment, bad tubes, etc.—and the root of the trouble may often lie in them.

As regards shipments coming from outside plants, testing is by non-destructive examination, both visual and X-ray. One or two pieces from each shipment are taken to the extremely well equipped Willow Run laboratory for such investigation. If indications are not satisfactory, shear tests and photomicrographs are taken.

Problems developing from employment of inexperienced help at Willow Run have been capably met. Nearly all employees in the department were trained on the ground; practically none had experience in welding before they entered the plant. Some complete the training program in four weeks or so, while others require the full 16-week learn-as-you-work course. Selection is made most often from those asking specifically for welding work. Women have been found to work out well when utilized on small parts fabrication.

Naturally, the work of resistance welders is simple in contrast to the skill required for arc or gas welding. Training of men and women to operate resistance welding machines is accomplished in a very minimum of time, due to a rather unusual use of set-up men in the department. Under this system, the operators do no more than actually run the machines. The set-up men handle the controls, which the workers are forbidden to touch, clear up assembly problems which may arise, and otherwise supervise quality. About 30 set-up men are thus engaged in the Willow Run welding department, supervising from five to ten machines apiece (depending on the volume of work going through them) and the several hundred resistance welding machine operators. In a word, these set-up men assume the responsibilities for quality which in an unspecialized department would be vested in the foremen or other general supervisors.

Metals and Alloys Comparison Charts

for

Indicating the Approximate Practical Adaptability of Metals in the Production of Small Parts.

By EDWARD ENGEL

Chief Engineer, Technical Processes Division, Colonial Alloys Co.

These charts are based on published data, and are correlated in non-metallurgical terms as much as possible; and shop nomenclatures are used as frequently as possible.

It is not supposed that metallurgists will find use for these charts as they are merely intended as an attempt to correlate complex data, and as such they are subject to the limitations inherent in all generalities and comparisons. However, it is expected that designers, production and sales personnels may obtain a broad view of complex matters which ordinarily may leave them confused after they study precise data and charts as prepared for metallurgists. These charts differ in certain respects from precise technical data charts in (1) presenting more emphasis on economical factors rather than on decimal point exactness as to the characteristics of the metals; (2) in showing costs in relation to the area of metals, rather than to their costs on only a weight basis; and (3) the charts attempt to indicate only the expected comparative values, and the fine differentiations and variables still remain the sphere of the metallurgists.

The numbers shown in the charts as numerals from 1 to 9 indicate the relative ratings, in which 1 represents the most desirable condition, while the progressively higher numerals correspond to increasingly less favorable costs, metals, designs, etc. The dash marks indicate the metals as not being available in the certain condition or that it is impractical for a said use. The X mark indicates a value as not ascertained. When two numbers are shown side by side it indicates a variable condition; when two numbers are shown in one column, as one under the other, the top number refers to the metal or alloy shown at the top of the listing, the bottom number corresponding to the metal or alloy shown at the bottom.

Symbols are Cu for copper, Fe for iron or steel, Zn for zinc, Al for aluminum, Mg for magnesium.

CHART I

	ALUMINUM			COPPER ALLOYS AND COPPER					FERROUS		OTHER NON-FERROUS		
	Sand and Die Casting Ingot	Non-Heat Treatable Types	Heat Treatable Types	Yellow Brass	Red Brass (80 Per Cent Type) (85 Per Cent Type)	Naval Brass and Free-Cutting Brass	Nickel Silvers (German Silver)	Copper and Other Copper Alloys	18-8 Stainless Steel	Mild Steel and Gray Iron	Magnesium Alloys	Monel Metal	Zinc and Zinc Die Castings
APPROXIMATE WEIGHTS AND PRICES PER 100 CUBIC INCHES, BASED ON AVERAGE PRICES OF POPULAR SIZES													
PURCHASED or MILL FORMS	10 lb. equal to 100 cu. in.	10 lb. equal to 100 cu. in.	10 lb. equal to 100 cu. in.	31 lb. equal to 100 cu. in.	31 lb. equal to 100 cu. in.	31 lb. equal to 100 cu. in.	30 lb. equal to 100 cu. in.	32 lb. equal to 100 cu. in.	28 lb. equal to 100 cu. in.	(29 lb.) (28 lb.) equal to 100 cu. in.	6.5 lb. equal to 100 cu. in.	32 lb. equal to 100 cu. in.	26 lb. equal to 100 cu. in.
Ingot	$1.50 / $1.80	$1.50	—	$3.15	$3.85	$3.10	$3.75	$3.90	—	— / $0.36	$1.35 to $1.60	$8.95	$2.20 / $3.00
Sheet	—	$3.00	$5.70	$6.00	$6.25	$7.60	$8.00	$6.50	$9.50	$0.60	$6.50	$12.50	$3.40
Rod, 0.5 in.	—	$2.60	$2.85	$4.60	$6.30	$5.90 / $8.15	$8.60	$5.90	$6.70	$1.50	$5.72	$14.50	—
Seamless tubing, 0.5 in.	—	$4.00	up to $14.00	$7.00	$7.50	$8.50	$13.50	$9.00	$56.00 Finished	$5.50	$5.72	$21.00	—
A typical extrusion	—	$4.00	$6.00	X	X	$6.30	$9.50	$6.70	—	—	$4.00	—	X
COMPARISONS OF PHYSICAL AND MECHANICAL PROPERTIES These figures are the number of thousands of pounds. Tensile strength per unit of specific gravity. (Tensile strength divided by the specific gravity.)													
Strength—weight ratio	15	10	25	6	10	9	10—15	6	19	(9) (6)	26	15	6
Hardness (Brinell)	23—96	23—35	22—116	55—180	55—180	90—180	42—107	58—107	135—460	53—265	40—70	120—350	100
Thermal conductivity	3	2	3	4	3	2	5	1	7	5	3	6	4
Electrical conductivity	3	2	3	4	3	4	4	1	7	6	4	3	5
Rigidity	4	5	4	3	3	3	2	3	1	1	5	2	6
Static and fatigue loading	4	4	3	3	3	3	X	5	1	2—5	4—5	2	—
COMPARISONS OF SURFACE TREATMENTS													
Electroplating	1	1	1	1	1	1	1	1	—	1	3	—	2
Anodic oxidation	1	1	2	—	—	—	—	—	—	—	3	—	—
Integral dye coloring	1	1	1	—	—	—	—	—	—	—	2	—	—
Hard surfacing	1	1	1	2	2	2	2	2	—	2	3	—	3
COMPARISONS OF CASTING-FORMING-MACHINING AND ASSEMBLING OPERATIONS													
Best Radii of bending	—	2	3	1	1	1	2	3	1	1	4	1	4
Extrudability	—	1	2	2	2	1	3	2	6	5	1	4	1
Drawability (stamping)	—	1	2	1	1	1	1	3	4	1	5	3	4
Spinning	—	1	3	2	2	2	2	3	6	4	5	3	4
Machinability	2	4	2	2	2	(3) (1)	3	4	5	3	1	3	2
Castability (sand)	1	—	1	2	2	2	2	3	3	1	1	2	—
Castability (permanent)	1	—	1	—	—	—	—	2	—	—	1	—	—
Castability (die)	1	—	—	—	—	—	—	3	—	—	2	—	1
Weldability	1	1	1	2	2	2	2	2	1	1	2	2	—
Solderability brazability	1	1	1	1	1	1	1	1	1	1	3	1	2

CHART II—COMPARISON FACTORS FOR SELECTING THE TYPE OF CASTING AND ALLOY

COMPARISON FACTORS	DIE CASTINGS				PERMANENT MOLDING			SAND CASTINGS				
	Aluminum Alloys	Copper Alloys	Magnesium Alloys	Zinc Alloys	Aluminum Alloys	Copper Alloys	Magnesium Alloys	Aluminum Alloys	Magnesium Alloys	Brass	Iron and Steel	Monel and 18-8 Stainless
Minimum and maximum sizes and weights	27x20x15 in. 1 oz. to 17 lb.	27x20x15 in. 4 oz. to 40 lb.	27x20x15 in. 1 oz. to 6 lb.	27x20x15 in. 1 oz. to 35 lb.	1 oz. to 50 lb.	6 oz. to 100 lb.	1 oz. to 50 lb.	About any size	About any size	About any size	About any size	About any size
Tolerances	0.0015 in.	0.002 in.	0.0015 in.	0.001 in.	0.016 in.	0.016 in.	0.016 in.	0.028 in.	0.028 in.	0.028 in.	0.028 in.	0.028 in.
Minimum wall thickness	0.040 in.	0.050 in.	0.050 in.	0.031 in.	0.090 in.	0.090 in.	0.090 in.	0.125 in.	0.125 in.	0.125 in.	0.125 in.	0.125 in.
Per cent porosity rating	2	2	2	2	1	1	1	3	3	3	3	3
Buffed appearance	1	1	2	1	1	1	2	2	3	2	4	1
Buffing costs	1	2	1	1	2	2	2	2	3	2	3	2
Final costs	2	4	2	1	3	5	3	4	4	6	3	7

CHART III—COMPARISON OF METHODS FOR THE VOLUME PRODUCTION OF SMALL PARTS

COMPARISON OF DESIGN AND COST FACTORS	DIE CASTINGS				SPECIAL CASTING**		PERMANENT MOLD CASTINGS			SAND CASTINGS				SCREW MACHINE PARTS				STAMPING OPERATIONS, DRAWING					PHENOLIC PLASTIC MOLDINGS
	Al	Cu	Zn	Mg	Centrifugally Cast	Plaster Paris Molds	Al	Cu	Mg	Al	Brass	Iron, Steel	Mg	Al	Mg	Brass, Monel	Steel, 18-8 Stainless	Al	Brass	Monel	Steel	18-8 Stainless	
Production speed	4	5	3	4	5	5	5	6	5	9	9	9	9	6	5	(6) (7)	(7) (8)	1	1	2	2	3	8
Cost of machining after casting	1	2	1	1	1 or none	1 or none	3	4	2	5	5	6	3	–	–	–	–	–	–	–	–	–	2
Tooling costs	4	5	3	4	X	X	3	3	3	2	2	2	2	1	1	1	1	5	5	5	5	5	3
Flexibility of design	2	2	2	2	1	1	3	3	3	1	1	1	1	5	5	5	5	4	4	4	4	4	3
Designability in one piece	1	1	1	1	1	1	2	2	2	3	3	3	3	4	4	4	4	4	4	4	4	4	3
Maximum size of piece	3	3	3	3	5	4	2	2	2	1	1	1	1	5	5	5	5	2	2	2	2	2	4
Control of location and of size of core holes	1	1	1	1	–	2	2	2	2	3	3	3	3	–	–	–	–	–	–	–	–	–	2
Appearance of buffed surfaces	2	4	3	4	X	X	2	4	3	5	5	6	5	1	1	1	(2) (1)	1	1	1	2	1	1
Thinness of cross-sections	2	2	2	2	2	2	3	3	3	4	4	4	4	2	2	2	2	1	1	1	1	1	2
Weight per piece of equal strength	4	6	5	3	X	X	2	6	3	2	6	7	3	1	2	(5) (3)	(5) (3)	1	5	4	6	3	4
Relative impact strength	5	4	6	8	X	X	4	3	6	4	3	7	8	3	6	2	1	3	2	1	1	1	8

CHART IV—RELATIVE MACHINABILITY OF METALS

(Horsepower Per Cubic Inch of Metal Removed Per Minute based on the work done by O. C. BOSTON, University of Michigan)
Comment: This is a highly complex characteristic and does not lend itself to simple and accurate determination

Operation	An Magnesium Alloy	An Aluminum Alloy	An Aluminum Alloy	Yellow Brass (70Cu-27Zn-2Pb-1Sn)	Brass Screw Stock	Cast Iron	Mild Steel	Copper Annealed	Monel Metal
Planning	1.00	1.51	2.21	2.22	2.26	4.08	6.88	7.49	13.32
Drilling	1.00	1.20	1.69	2.02	1.76	3.41	6.50	10.00	8.20
Milling	1.00	1.36	1.57	2.58	2.10	3.05	5.83	5.49	8.72

CHART V

Comparisons of the Expected or Probable Corrosion Resistances of Metals

TYPES OF ATMOSPHERIC AND OTHER EXPOSURES	Al	Al Anodized	Mg Anodized	Nickel Silver	Red Brass	Copper	Monel	18-8 Stainless	Mild Steel	Gray Iron	Tin	Zinc	Plastics
Sea shore air	3	2	4	2	2	2	1	1	4	3	2	3	2
Industrial air	2	1	3	2	1	1	1	1	3	2	1	1	1
Tap water	4 to 2	2 to 1	4	2	3 to 1	2	1	1	4	3	4	3	4
Brackish water	2	2 to 1	4 to 3	2	4 to 3	3 to 2	X	1	3	3	4	3	4
Sea water	3	2	4	3	3 to 2	2	1	2	4	3	4 to 2	3	5
Wet steam	2	2	4	2	1	1 to 2	1	1	3	2	4	4	5
Fruit and vegetable juices	2	2 to 1	X	3 to 2	3 to 2	3 to 2	2	1	4	4	1	–	1 to 5
Dairy products	2	2 to 1	X	4	4	4	2 to 1	1	4	4	2	–	3 to 5
Other foodstuffs	2	2 to 1	X	X	4	3	2 to 1	1	4	4 to 2	2	–	1 to 5

Additional Factors for Consideration When Making a Survey of the Adaptability of Metals

RELATIVE ELECTROLYTIC REACTIONS BETWEEN METALS (GALVANIC CORROSION)

If a product made of two or more metals is to be continually exposed to seashore atmosphere or to moisture the following considerations must be given:

Aluminum should not be fabricated as part of such an assembly, under the stated type of exposures, with other metals, with the possible exceptions of magnesium and zinc. That is, unless the metals in contact are protected in some manner such as by electroplating. Zinc or cadmium plated on steel when in contact with aluminum will tend to prevent galvanic action in all but the most severe exposures.

The assembly of aluminum with other metals should therefore be appropriately electroplated either as an assembly or each element may be plated separately as best meets requirements.

Magnesium follows the same rule as aluminum, but no suitable means has been devised to protect it against such types of exposure, except in some instances by painting.

Under the conditions of exposure as outlined copper should not be in direct contact with iron or steel unless the latter metals are properly coated. When such an assembly is exposed to hot water or steam these metals must be electroplated.

PROTECTION OF METALS AGAINST CORROSION BY ELECTROPLATING

In general, decorative electroplated deposits of the thickness usually found on exterior parts of motor cars will increase the corrosion resistances of the metals beyond that indicated in Chart V.

INCREASING THE ABRASION AND IMPACT RESISTANCES OF METALS BY HARD SURFACING

The softer metals will have their abrasion and impact resistances considerably increased by hard surfacing, i.e.,, by electroplating deposits of heavier thicknesses of nickel or chromium than ordinarily used for decorative purposes.

COEFFICIENT OF FRICTION

Metals such as aluminum with a low coefficient of friction are practically valueless as bearing surfaces; but electrodeposits of hard chromium or of porous chromium may make these light weight alloys adaptable for bearing surfaces.

KEY CONSIDERATIONS

Plans for the production of small parts should take into consideration the following factors:

(1) The new alloys among the light weight metals and among the steels. Some of the new glasses will have interesting properties in combination with metals.

(2) The more competitive prices resulting from increased production of the light weight metals.

(3) The prospects of reduced relative production costs due to metal workers having increased knowledge and experience with the light weight alloys.

And the new technics and improved methods as well as the increased facilities.

(4) In the assembly of parts, i.e., welding, soldering and brazing.

(5) In forging, permanent molding and die casting.

(6) In the electroplating and in the hard surfacing of the light weight alloys.

(7) In the processes for the protection of the light weight alloys against corrosion.

(8) In the processes for the integral dye coloring of the light weight alloys.

(9) And some consideration may be given to taking full advantage of the superior digital dexterity of women workers, by the greater consideration of the light weight alloys as a means of speeding up production, assembly and finishing operations.

(10) The light weight alloys may tend to save the user some costs resulting from lower transportation and packaging costs.

**(11) The light weight alloys also tend to lend themselves more readily to some new methods now trying out the markets: (1) the casting in Plaster of Paris molds, and (2) the centrifugal casting under electrothermal control. In the latter method there are indications that properties may be obtained which closely approximate those attained in forging operations. This process may lend itself to the field of production somewhere between the die and the permanent molding methods. Little comparative data is presented about these two new processes in the charts as their uses have not been extensive enough to permit of fair comparisons.

(12) Powder metallurgy is not tabulated in the charts as production is not as yet sufficiently stabilized to obtain accurate data. This method has excellent possibilities for fair volumes of small parts of intricate designs, especially when such designs would require extensive or difficult machining if made of bar stock or castings. Iron, aluminum and copper alloys have been produced in volume by the powder metallurgical processes. The parts produced in iron have strengths somewhat greater than in sand casting, being about 38,000 lb. per sq. in. Parts produced by this process may be plated. Doubtless iron powder will be available for under 15c. per lb. as production rises, and the costs of forming will be depended on the usual factors. The production rate is about 10 to 60 pieces per min. for small parts.

(13) Those metals which can be cast with good properties can also be forged. Forging is resorted to in order to obtain shapes similar to those obtainable in cast forms, but with increased mechanical and physical characteristics. Forging data is not included in the comparison charts as it is believed that this method of metal working comes under special engineering requirements.

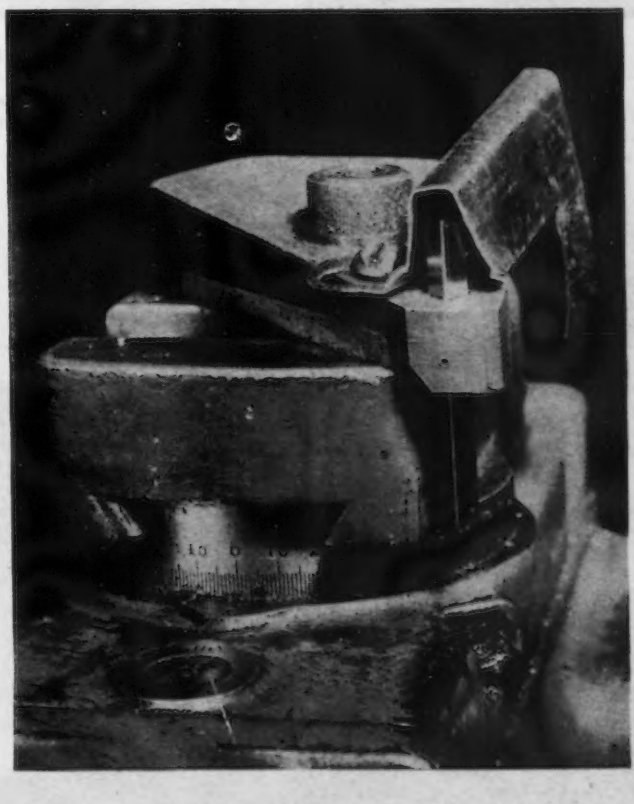
(14) New methods in spinning aluminum, brasses, copper and certain ferrous metals have been developed e.g.; in the spinning of airplane cowls and in the production of primer tubes (dome shaped closed ends) from seamless tubing at the rate of 2500 per hr., at a great scrap saving and with less operations.

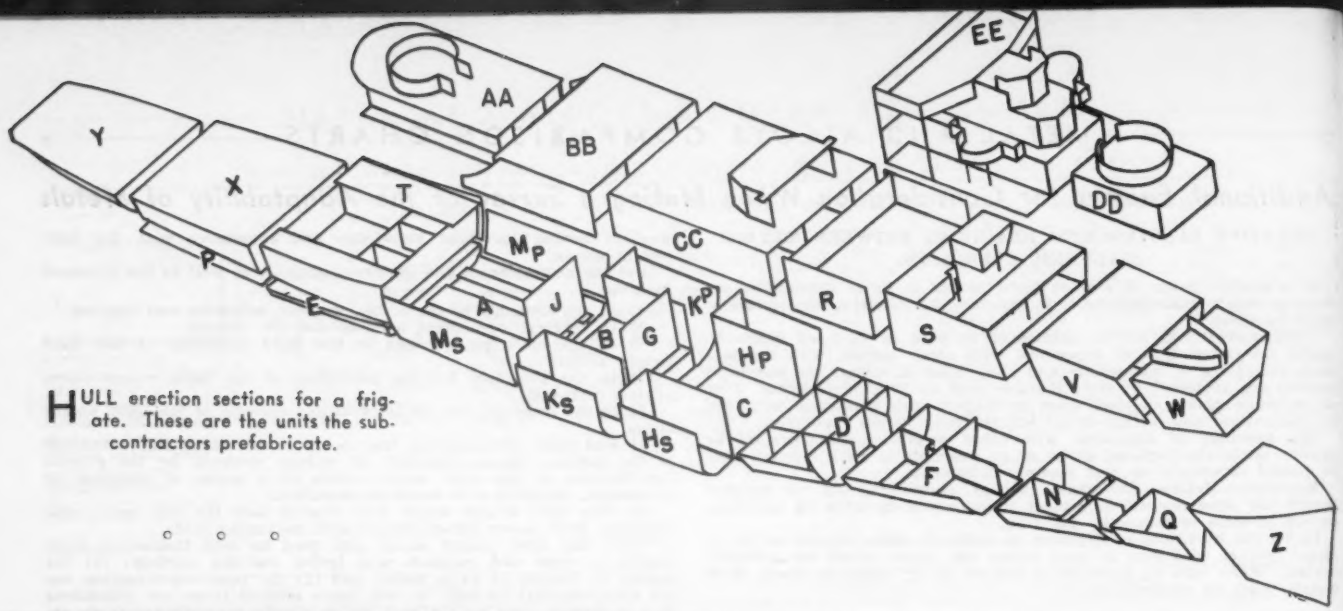
(15) Speedier and more efficient methods for cleaning, lacquering and the electroplating of metals have been developed by the necessities of war.

Hood Collects Chips of Precious Metals

A SPECIAL vertical tool mounting and hood for use when turning platinum and silver alloys in a bench lathe permits a fine finish, minimizes cuts, and serves as a chip collector for the precious metals. The arrangement was devised by Joseph Geenens, an assistant general foreman at a General Electric plant.

The tool is mounted vertically in the front corner of a triangular steel block. The undersurface of the block is cut at an angle to provide adjustment when mounted on the compound rest of the lathe. The tool is ground without a chip curler, that is it has a flat rake surface, and the hood collects the chips and carries them back along the block away from the work. This prevents the chips, which are somewhat long, tough and stringy, from becoming entangled in the work. The turning time has been halved by use of this arrangement.





HULL erection sections for a frigate. These are the units the subcontractors prefabricate.

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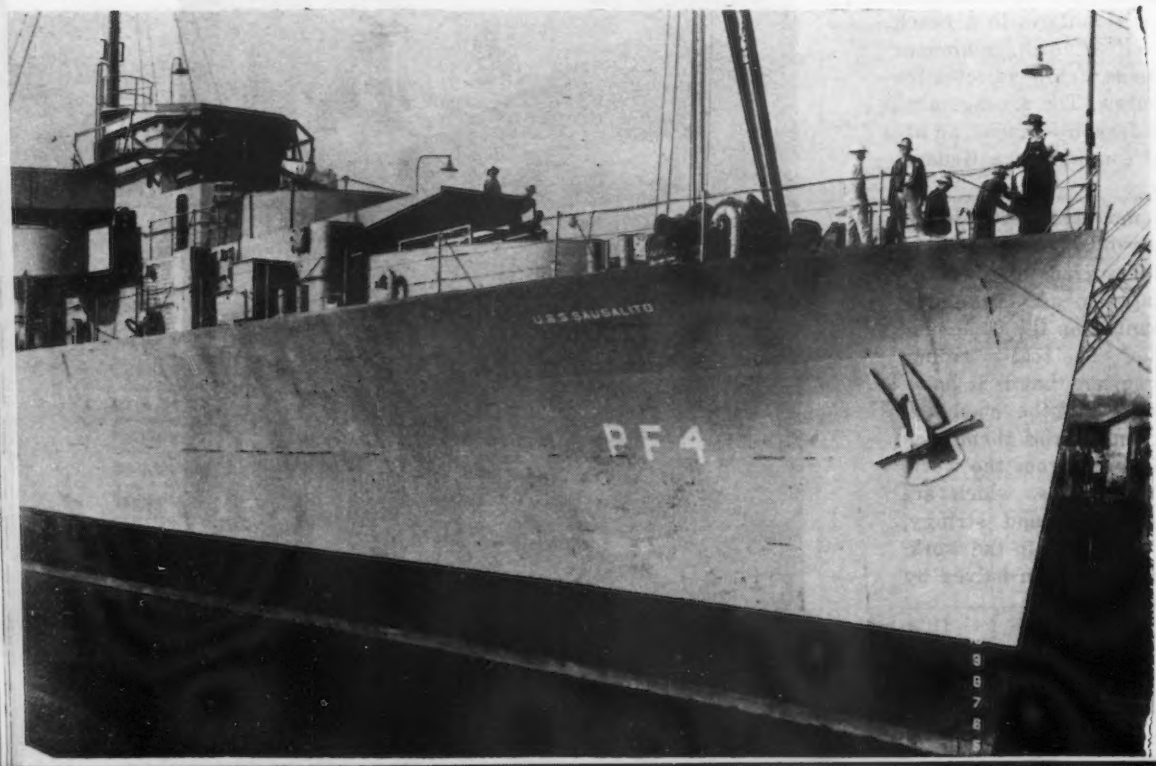
A FRIGATE fore peak (Section 2) being floated from the Pacific Coast Engineering Co., Alameda, to Richmond No. 4 yard. A bulkhead was welded to the open side and then the section slid down the ways and a tugboat used to move it to the assembly yard.

Pre

FRIGATE or destroyer escort vessels are being assembled in the Richmond, Cal., No. 4 yard of the Kaiser Co., Inc., from prefabricated units constructed by a dozen or more subcontractors located in various cities up and down the Pacific coast as far away as Los Angeles. Most of the cooperating firms are plate fabricators and include such companies as Herrick Iron Works, Independent Works, Ltd., Sacramento Industries, and Western Pipe & Steel Co.

The companies were chosen by their location, size and weight of the sections they could build and means of transportation available. Two of the sections, the fore and after peaks



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A FRIGATE or destroyer escort vessel at the outfitting dock. It was made completely from prefabricated units.

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SECTIONS F, S, N and V have been assembled into a single unit before being placed on the ways from which this and other units will be welded together and launched as a hull.

o o o

fabricated Escort Vessels

for example, are floated to the yard as shown in the illustration. It was found that this method of delivery is safer for these awkward sections than using barges because the weight on a barge would be unevenly distributed the load would ride at a mean angle and in rough weather would dump the load and the barge, too.

About 65 per cent of the sections (see sketch) are prefabricated along the seaboard close to the water so they can be brought in by barge. One 57-ton section is made on a jig about 150 ft. from the water line. Moveable shelters are built over the jig so that a steady flow of production can be maintained even in bad weather. After these sections have been inspected and are ready to be delivered they are slid down greased wooden ways and a crane puts them on the barge.

Some of the units are delivered by truck and trailer. One section takes so much room on the highway that a special permit is necessary from the state highway department every time a delivery is made. Police escorts must be provided for these loads and delivery is scheduled for hours when the traffic is not at a peak.

The success of prefabrication of frigates is due to rigid inspection. Units are built right and then okayed at the plants before they are released so that a major unit will not have to be scrapped after delivery or returned to any plant.

This method of ship prefabrication has other advantages. It spreads out the work, it provides employment for men that do not have to be taught from the ground up, and it furnishes work for thousands of people all over California without transportation troubles, housing worries and other difficulties, common to the West Coast. These workers are able to live in their own homes, do their shopping in their own community, and keep the children in the schools they are used to.

FABRICATION of sections S, NV and DR. In handling these heavy sections the gantry cranes shown in the background are brought into play.

THIS shows the after peak unit (Section Y) under construction at Alameda. A bulkhead will be welded to the open side and then this section will be floated to the assembly yard in the same manner as the fore peak.

Strip Mill Butt-Flash Welding

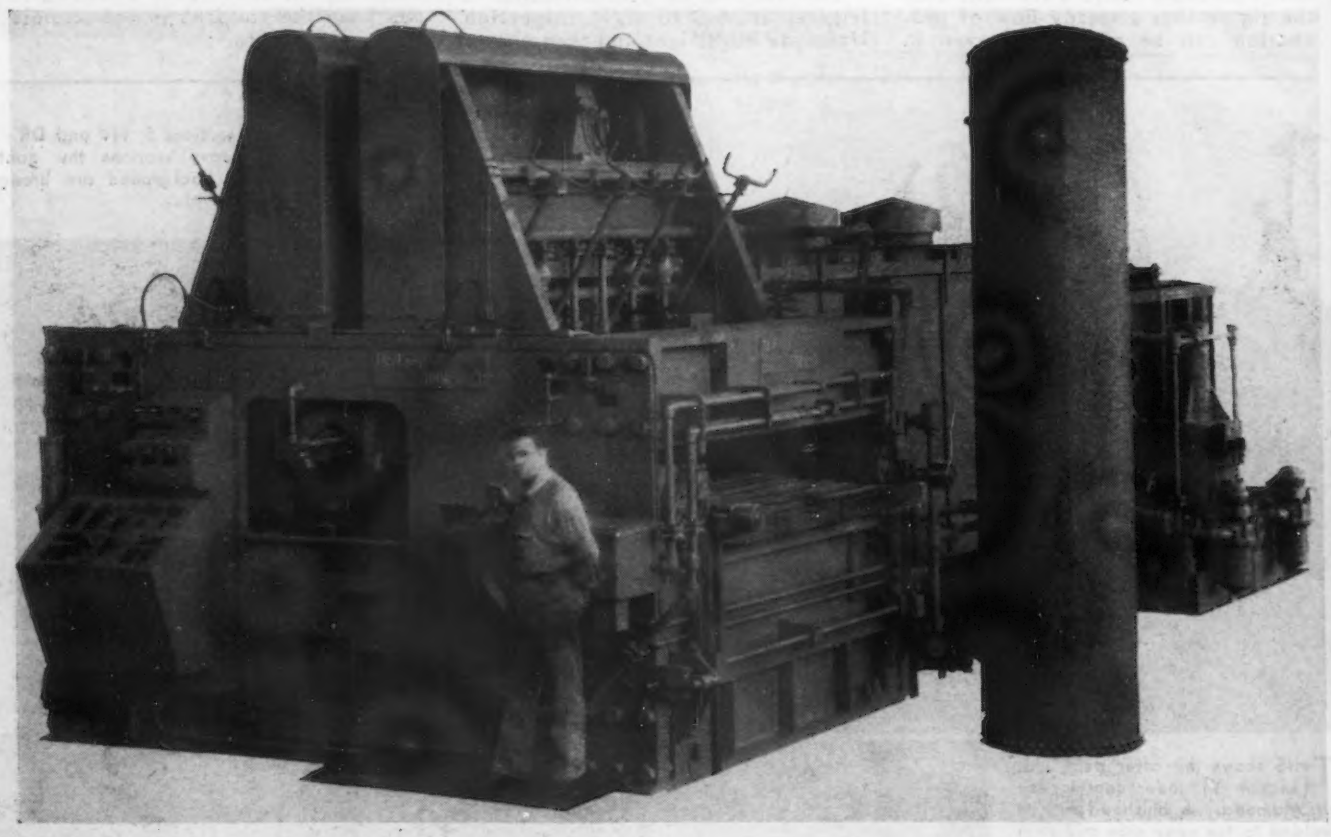
MANY design improvements have been incorporated in an 80-in. butt-flash welder built by Taylor Winfield Corp. for installation in a hot rolled strip line, feeding a continuous pickling line and a cold reducing mill for tin plate. This machine will weld strip ranging from approximately 0.075 in. minimum thickness to 0.187 in. maximum thickness and from 18 to 80 in. width of low carbon steel (Fig. 1).

The main frame consists of two steel side plates which support stationary and upsetting clamping frames, mounted vertically. These clamping frames are of the C-type, similar to punch press frames, and are duplicate in construction so that there is no differential in deflection under the heavy clamping loads. The upsetting clamping frame slides along graphite impregnated Bakelite bearings on the main frame under the power of two hydraulic rams.

The welding dies, Fig. 2, combine the current conducting dies and also steel pressure dies used to resist slippage during upsetting. Between the lower halves of the current conducting and steel clamping dies are anti-friction bearing rollers. In the upclamped position these rollers raise above the level of the dies and lift the strip sufficiently high to prevent it dragging over the dies and causing excessive wear, which would in turn cause the weld to be out of alinement.

During operation the strip is supported through the welder with pivoting tables holding the strip carrying rolls. The use of heavy 4 in. diameter rolls spanning half of the full strip width, Fig. 3, makes a construction which will take a lot of abuse without deforming the conveyor rolls. Plates between the individual rollers are fitted sufficiently close to the rolls so that there is no possibility of the strip ends entering. Approximately half of the conveyor rolls within the length of the welder on each side of the flash line are raised each time the clamps are lifted. This action also helps prevent dragging of strip over the current conducting welding dies.

FIG. 1—Hydraulic operated 80-in. strip welder showing the controls, pumping unit, accumulator unit, mechanical adjustment, and gas house (right rear).



Strip Alinement

In most continuous strip applications, the major problem of strip welding is the handling of the strip through the welder and welding op-

eration so that the matching edges to be welded are parallel, are in proper cross alinement so that the difference in width between head end and tail end of the strip is equally divided, and the ends of the strip are not deformed during shearing. Due to the camber which is present in all continuous strip, the method of shearing of the ends of the strip previous to their being positioned in the welder, while common practice in most installations, has not proven entirely satisfactory. Another factor which affects the quality of the weld is the tendency for the squaring shear to bend the ends of the strip at a point approximately an inch from the sheared edge either upward or downward depending on whether it is the head or tail end of the strip.

To overcome this condition of unequal contact at the weld line, this new welder is equipped with two cutting torches which trim the ends of the strip so that they are exactly parallel. In the interests of obtaining as high an operating speed as possible, the cut ends of the strip are rougher than that normally considered as satisfactory when gas cutting for structural purposes, but this roughness helps cause the flashing action to start more readily. As to the speed of cutting or rather "high speed washing," tests have shown that the following approximate cutting speeds can be obtained: ⅛ in. thick strip—10 ft. per min.; 3/16 in. strip—8 ft. per min.

Air operated side guides, more properly called "matching guides," are provided to aline the head and tail end of the strip. The guides are used only to contact the strip when it is stationary and when not in use are retracted back of stationary guiding shoes which protect the matching guides from the strip when it is moving. The side guide cylinders are supplied with air through solenoid operated valves controlled from push buttons mounted on the operating bench board.

When the strip ends have been clamped upon the current conducting dies and the contacting edges of the strip trimmed parallel by the gas torches, a hydraulic hand valve permits one clamping member to be traversed at right angles to the pass line so as to aline the strip ends without any reclamping.

Upset cylinders are mounted on either side of the strip in the same plane with the weld line, thus eliminating any offset load being imposed upon the welder during the upsetting operation. To the right of the pass line is an enclosure containing a power driven ram which carries hardened steel cutting blocks for keeping the vertical faces of the current conducting dies free of accumulated flash and also the cutting torches that trim the strip ends parallel. This ram also acts as a stop against which to position the ends of the strip before clamping. The ram is driven by a hydraulic cylinder operating through a roller chain and set of sprockets to multiply the cylinder stroke by approximately three to one. The en-

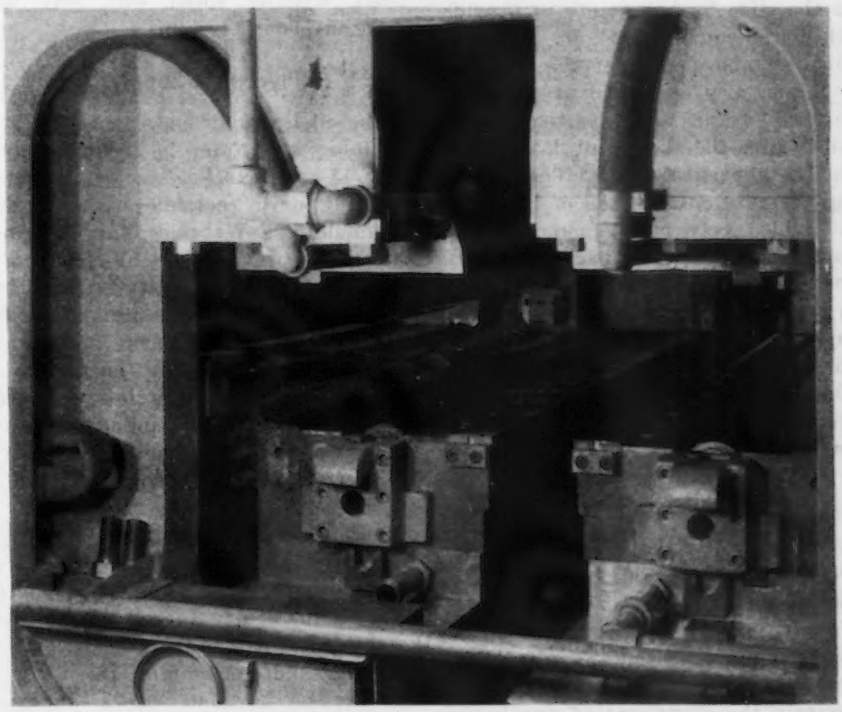


FIG. 2—Close-up of the welding die arrangement in the 80-in. strip welder. The rollers are retracted when the dies are clamped on the strip.

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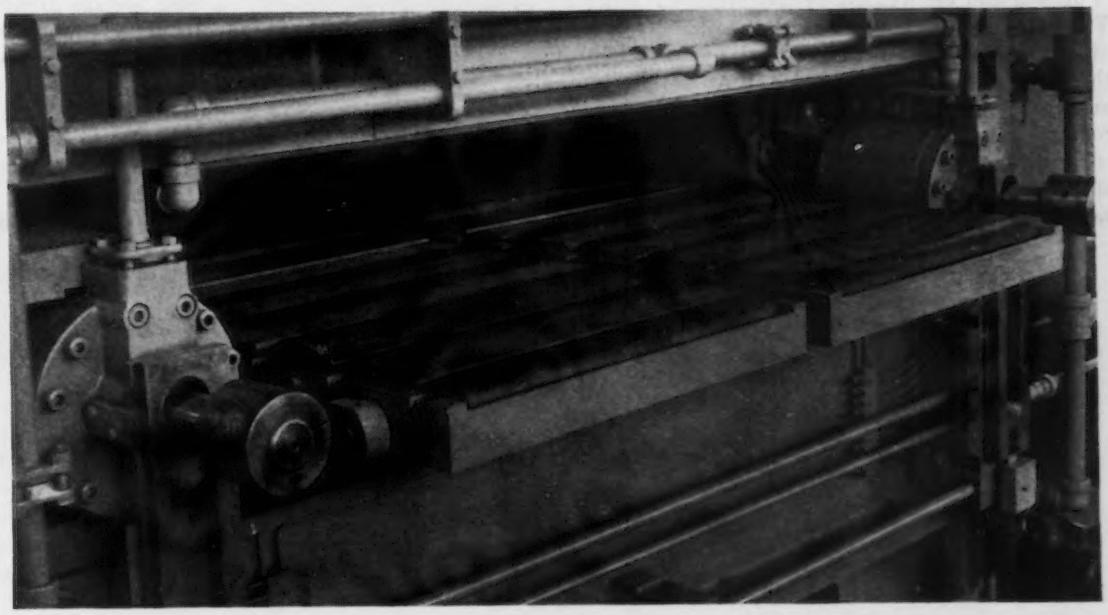

FIG. 3—Strip rolls and upset cylinder arrangement. To prevent the strip from dragging over welding dies the rolls are raised when the clamps are lifted.

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closure which protects the ram mechanism from flash also contains the necessary racks, manifold, pressure regulators and gages for the oxygen and acetylene gas tanks which provide gas for the cutting torches.

Clamping Arrangement

The heavy steel C-type clamping frames each carry the upper dies through the medium of a slide operated by direct-acting hydraulic cylinders. The design is such that the upper dies float to position as determined by the lower dies so as to uniformly clamp the strip over its full width.

Each C-frame contains six pressure cylinders and they are attached to the slide by ball joints to provide adequate equalization of pressure. Directly above each of the slides is a torque arm connected at each end to bell cranks and vertical links which give the slides full floating action in a vertical plane. The clamping pressure on each end of the strip is divided between the current conducting die and steel back die. This permits the use of the high clamping pressure necessary to prevent slippage during upset and yet does not impose excessive loads on the copper alloy current conducting dies. It also prevents excessively high off-center loading of the slide ways.

Welder Control

The control is the latest automatic hydraulic type. The principle is known as a "follow-up valve," and it gives the operator full control of the welding operation at all times since the main welding slide follows precisely the movement of the lever in all its motions. In production when the lever is moved forward, the valve is opened and the welding cycle starts. The main upset slide moves forward at a predetermined rate required by the material being welded. An auxiliary switch is connected to the control and when the flashing period is finished, the welding current is cut off shortly after the start of the upsetting action.

After the starting of the flashing action, the welding cycle is entirely automatic, yet the operator may reverse the machine at any time by movement of the control lever. The flashing time may be adjusted through a range of from 4 to 40 sec. by means of a needle valve with a calibrated dial. The amount of upset may be quickly changed for various gages of stock by adjusting a calibrated upset control. A calibrated adjustment on the flashing cam permits rapid adjustment of the cam for various stock thicknesses. The final die opening, which must be adjusted for stock thicknesses, is varied by the turning of a spacing bar handle. Adjustments of die opening, amount of upset, welding speed, etc., may be made in about 1½ min.

Hydraulic Supply

The oil hydraulic power supply for clamping and upset is furnished by two 15-hp. parallel motor driven pumping units complete with oil-air accumulators. Water cooling coils in the sump prevent the oil reaching excessively high temperatures. Pumps are of the style which permit rapid traverse at high volume and low pressure followed up by the application of high pressure at low volume. The input of each pump passes through a motor driven oil filter. Pressure switches operate indicator lights on the control board to show proper operation of the pumping system. While the primary purpose of providing two pumping units in parallel is to obtain double the oil output to keep to a minimum the time used in clamping and unclamping the strip, the use of adequate check valves makes it possible that if either one of the hydraulic supply circuits goes out of commission the equipment will function until this unit is repaired, although the clamping and unclamping action will be at half speed.

Transformers

Three Taylor-Winfield 300 kva. transformers are connected with their primaries and secondaries in parallel to supply the welding power. These three transformers are so connected that a high degree of uniformity of current distribution along the weld is obtained.

The transformers have cast copper secondaries bolted together with insulated bolts to mechanically support them against the surge action of the upsetting current. The primary coils and secondary are assembled into a low-loss core made of high quality varnish coated silicon transformer steel. Molded mica insulators and barriers are placed between the coils and core as well as between individual coils. The assembled transformer is saturated with thermo setting varnish and oven baked. This method of construction provides a transformer virtually impervious to flash and current surges as well as one with a high margin of safety against voltage breakdown.

No water cooling is necessary with this butt-flash welder except for cooling the oil. The reason for this is that throughout the welder and in the construction of the transformers, terminals, dies, etc., a larger amount of copper and copper alloys are used to obtain low impedance, and since the duty cycle is so low the thermal load is almost negligible.

The 440 volt power supply to the three transformers is controlled by a 1200 amp., four pole, magnetically operated welding contactor of the enclosed type. An alternate to this primary current interrupting device is the use of an ignitron contactor with a phase-shifting heat control having two heat potentiometers and additional load resistors to provide the minimum current requirements for firing the ignitron tubes. The use of the two heat control potentiometers permits the supplying of a dual voltage arrangement which results in having high current for the initial starting of the flashing action, and the automatic reduction of the flashing current after the flashing action has been well established. These heat controls also give a vernier adjustment of welding current between the taps on the welding transformer.

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Notes on Hot Dip Coating

By ALLEN T. BALDWIN
Hanson-Van Winkle-Munning Co., Matawan, N. J.

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A LARGE steel company recently felt that it had reached the limit in savings when dross was reduced from 35 lb. per ton of pipe galvanized to about 19 lb. Now, by further improvements permissible in part through the proper use of flux, the dross figures are down to about 12 lb. per ton of pipe. Another large manufacturer of tanks reduced his weekly re-processing of defective tanks from 450 to about 25.

* * *

SOME authorities on hot dip galvanizing are urging the use of a dilute cold sodium cyanide neutralizing dip to follow pickling and rinsing, and to precede fluxing. They recommend ½ oz. per gal. each of sodium cyanide and sodium hydroxide. The removal of final traces of iron salts in a following rinse is made easier because they are in the form of soluble double cyanides. Less iron salts, therefore, are carried into the flux wash. Sheet metal surfaces have less stain and smut on them when neutralized this way.

* * *

AN improvement in galvanizing practice is embodied in a system of dry gas pickling for strip (which might be applied to wire) whereby a well-etched surface free of any oxides, chlorides or sulphates is delivered to the galvanizing kettle at speeds exceeding 100 ft. per min. The proper flux is used satisfactorily as a pre-dip and the resulting product has tight ductile coats which can be deep drawn, etc. The dry gas pickling consists in burning chlorine in natural gas to produce water-free hydrochloric acid gas. This is cooled down to between 1000 deg. and 1350 deg. F. and removes oxides and scale as a ferric chloride vapor.

* * *

THE use of hot-dip lead coatings is now being suggested for practically all uses now commonly calling for hot galvanizing. A lead alloy is offered, consisting of 95 per cent lead, 2½ per cent tin, and the balance other metals in which antimony and silver may be present. At least two large steel companies are regularly producing hot lead dipped sheets. Fluxes are available for this work, with no special precautions except great care in cleanliness and rinsing.

* * *

THE theory is being advanced that pin holes in hot lead dip coatings are not conducive to corrosion, but that they become centers of protection. It is thought that the iron corrosion products which are ferrous when formed, may oxidize in air to form ferric compounds (like lead ferrite) which have slight solubility in water and are cathodic to lead. Ferric salts, being cathodic with respect to lead, would cause the lead to act sacrificially and thus protect iron at the pin-hole. Insofar as this theory is correct, it would apply to both electroplated and hot dipped coats.

Trends in Permanent Magnet Alloys

PERMANENT magnet materials which have relatively higher coercive force, and higher residual induction, good machinability and use a minimum of critical materials have been developed in recent years. Their availability has greatly influenced the design of electrical indicating instruments, according to a paper delivered before the winter technical meeting of the A.I.E.E. by M. S. Wilson and J. M. W. Henton of General Electric's West Lynn works. Instruments more sturdy and reliable and of higher sensitivity have been made possible by use of the newer alloys.

For the past 15 to 20 years, 36 per cent cobalt steel permanent magnets have provided a means of producing higher sensitivities in instruments. This material has been used in forged and cast forms and is most desirable from the standpoint of high coervice force and total energy value. However, its inherent high cost limits its use primarily to the higher sensitivity instruments where the chrome (8 per cent) and tungsten (5 per cent) steels are unsatisfactory.

More recently, great advances have been made in permanent magnet materials by the development of the aluminum-nickel-cobalt iron (Alnico) alloys. These are of particular interest to the electrical instrument designer because of their even higher coercive force and available energy. These magnets are characterized in electrical instrument design by their relatively large cross-section and short length which produce a given flux across a given air gap ratio. They are highly resistant to demagnetizing fields due to their high coercive force. Manufacture of Alnico materials may be carried out by either of two methods—the sintering process or casting, mostly the latter. Sintering is usually employed to produce relatively small magnets, particularly damping magnets and the like.

An even newer material and one containing less critical materials is Comol, whose typical composition is 12 per cent cobalt, 17 per cent molybdenum and the balance iron. It comes closer to the specifications of an ideal magnet than any other material since it has high coercive force, residual induction and available energy, besides having good machining and fabricating qualities. The alloy can be easily cast and when properly heat treated can readily be machined. With Comol, a coercive force of about 245 is obtained compared with 210 for a 36 per cent cobalt steel. Residual induction of 10,300 gausses is higher than either 36 per cent cobalt steel or Alnico II. Comol has a maximum energy value of 1,100,000 ergs as compared with 930,000 for 36 per cent cobalt steel and 1,650,000 ergs for Alnico II.

A magnet of the Comol type containing appreciably lower percentage of the critical elements has been utilized in instrument application as the permanent magnet in a new "thin" line of d.c. and radio frequency G-E small panel, permanent magnet, moving coil type instruments.

New Equipment . . .

Small Tools

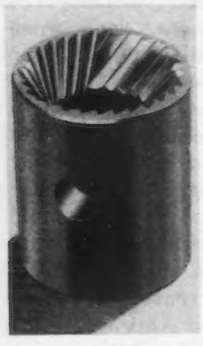
Some new developments in cutters, borers, reamers, burring tools, cemented carbide files, lathe and grinder accessories are shown in the following pages.

A FLOATING tool holder is announced by *Empire Tool Co.*, 8774 Grinnell Avenue, Detroit 13. Made of only five component parts, the moving parts riding on rollers so placed as to affect a perfect self adjustment of the float in any direc-

tion, the holder is said to ream holes with close tolerances to absolute size and perfect roundness. The rollers also contribute to making the members antifriction and to producing smoother running. The bodies are available in 2½ and 3 in. sizes.

Deburring Cutters

A COOLANT hole has been incorporated in the outside deburring cutter produced by the *Severance Tool Industries, Inc.*, 706 Iowa Avenue, Saginaw, Mich., for use on automatic screw machines and turret lathes in which the tool is stationary and work revolves. The coolant hole is located in the side of the cutter so that the flow of coolant is from the inside of cutter across the cutting teeth. This direction of flow cools the work and washes chips out of the cutter.



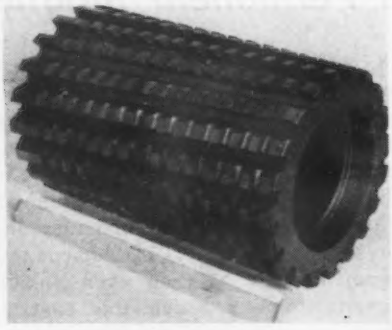
Boring Tool

A TYPE of boring tool that is said to get diamond boring machine results from an ordinary lathe has been developed by the *Shearcut Tool Co.*, 19600 Sherman Way, Reseda, Cal. Called the Boring Bit, it has a circular cutting edge. The shearing action leaves a curled chip and allows large cuts to be taken without chatter. Chips sliding back over the cutting edge have a resharpening action. Cutting speeds are up to 1000 ft. per min. The mirror finish produced in

one operation usually eliminates any necessity for grinding, filing, reaming or polishing to remove tool marks. It is said to work well with either a positive or negative rake.

Large Hob

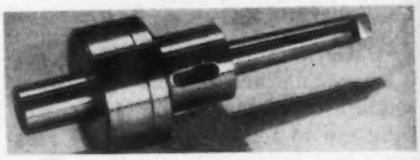
A HOB 8 in. in diameter and 12¾ in. long has been produced by the *Pipe Machinery Co.*, 930 East



70th Street, Cleveland 8. It has been made from a solid high speed steel forging. Although more difficult to produce than a segmented cutter, it is said to be much more satisfactory in performance.

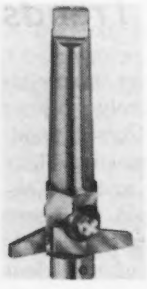
Floating Tool Holder

THE three sliding pin-drive tool holder put out by the *F & H Mfg. Co.*, 10338 Gratiot Avenue, Detroit 13, embodies a combination drive. It is driven on three sliding pins which set angularly in three equal spaces, resulting in correct floating at all times. It is adaptable to machines for single and multiple spindle tapping, reaming, counterboring and threadcutting with adjustable die heads or solid dies. Shanks are furnished to fit all makes of machines.



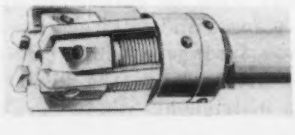
Counterbore and Spotfacer

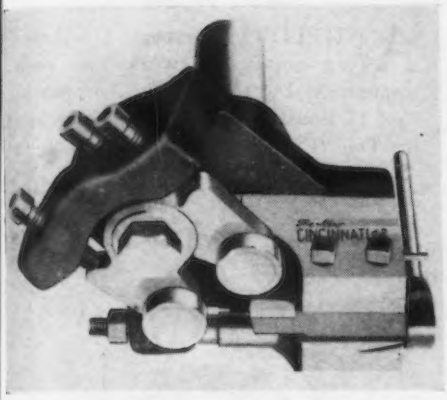
AN adjustable blade counterbore and spotfacer is announced by the *Robert H. Clark Co.*, 3424 Sunset Boulevard, Los Angeles 26. Instead of a group of fixed-diameter bits interchangeable on a standard shank, the blades themselves are adjustable to any diameter. The interchangeable pilots are so designed that burrs are prevented from forming at the edge of the pilot hole. Eight sizes cover diameters from 9/16 to 5½ in. and pilots from 3/16 to 5¼ in. The tool is equipped with Tantung blades.



Reamers

A NEW line of reamers, comprising left and right-hand cutting angles, with high speed steel, cast alloy or tungsten carbide tipped inserted blades is announced by *Wetmore Reamer Co.*, 418 North 27th Street, Milwaukee 8. The adjustable, inserted blade design makes it possible to maintain new tool efficiency, it is claimed. The reamers are available in sizes and styles for holes from ⅝ to 6 in.





Releasing Box Tool

A CINCINNATI No. 2 releasing box tool that can be set up by inexperienced help (using stock ground lathe tool bits) is being manufactured by the *Valley Tool & Supply Co.*, 5507 Morella Avenue, North Hollywood, Cal. It is especially made for use on turret lathes and has a turning capacity of ¼ to 1 1/16 in. diameter 3 in. long. A retracting tool mechanism draws the tool bit away from the turned stock. The retracting adjustment screw is made with a fine thread and is locked with a lock nut. A rocker under the tool bit permits locating center quickly after regrinding the tool.

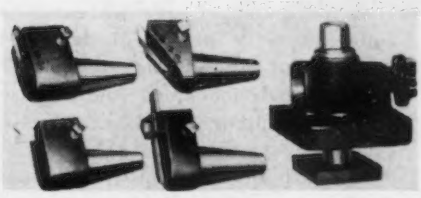
Cemented Carbide File

KENNAMETAL INC., 144 Lloyd Avenue, Latrobe, Pa., has developed a file made of hard, high strength cemented carbide compositions. Filing speeds three to ten times faster than steel files is said to be possible. It will cut steels of a hardness up to 62 Rockwell C and works well on cast iron and brass at surface speeds around 900 ft. per min. The model F76 is 11 in. long, ¾ in. wide and ⅜ in. thick, having a substantial filing surface 4 in. long. It is made of grade K4H Kennametal, and is single cut with teeth at 30 in. shear angle, 40 per in.

Inset shows portion of filing surface actual size, unretouched.

Lathe Tools

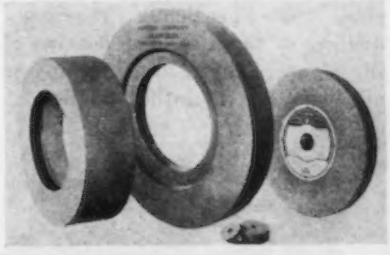
ENGINE lathe tooling is claimed to be simplified and production facilitated by K-J Quick Change lathe tools. manufactured by the *Kyle-Johnson Machine Co.*, 1657 West Pico Street, Los Angeles. Operations



may be changed quickly without the use of wrenches after setup has been determined. The tools are held in a special non-bind-tapered recess and rigidly secured. Drilling is facilitated by using the machine feed. Threading, turning or alternative operations in any combination may be done. For boring, the same holder will accommodate boring bars ¼ to 1 in.

Grinding Wheels

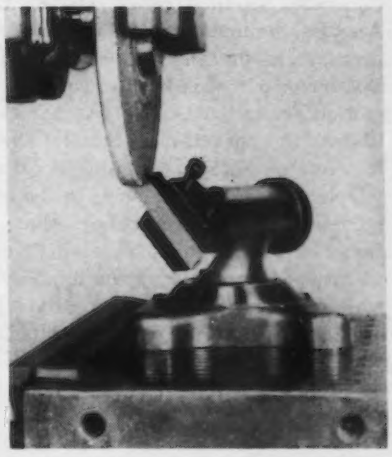
GRINDING WHEELS made of their 57 Alundum abrasive are now available for general use from the *Norton Co.*, Worcester, Mass. It is claimed that the wheels have a fast,



cool cutting action as they tend to keep themselves sharp but they also have the ability to hold shape and require few dressings. They are said to be especially useful in crankshaft grinding where the ability of the wheel corner to stand up is important. They are available in the patented Norton BE vitrified bond as well as in regular vitrified bond in a wide range of grain sizes, grades and structures.

Tool Grinding Fixture

WHEN the model G universal grinding fixture is put on a surface grinder, inexperienced operators can quickly produce uniformly



ground tool bits for both right and left hand screw machine tools, according to the manufacturer, the *Boyar-Schultz Corp.*, 2110 Walnut Street, Chicago 12. Any desired chip breaker angle can be ground to suit the type of material. Settings provide for repeating any angle.

High Speed Grinder Motor

AN electric motor operating at 120,000 r.p.m. at 2000 cycles has been built and tested by *General Electric Co.*, Schenectady. It was developed for application to internal grinding machines used in finish grinding small holes ¼ in. in diameter or less, and in driving small drill chucks for drilling tiny holes in metals, using drills 1/32 in. in diameter or less. Full speed is reached in less than a second. It is rated 3 hp. and weighs but 7 lb. It is water cooled. The motor will not be available for general use until after the war.

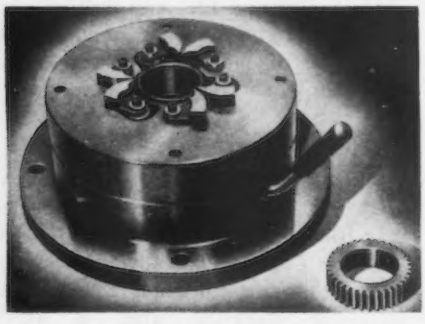
Burring Tool

ALL their burr removing and chamfering tools are now being manufactured with the pilot shafts hard chrome plated, the *Nobur Mfg.*

Co., 910 North Orange Drive, Los Angeles, announces. Used in a drill press, lathe or other machine spindle, this burring tool is kept in continuous motion while parts are fed to it as fast as the operator can handle them. It consists of a cylindrical shaft which pilots in the hole to be deburred. A knurled collar that is fastened to one end of the shaft can be grasped and held by the hand even while the shaft is rotating. By sliding the collar up or down the burring blade may be advanced into cutting position or withdrawn.

Gear Chuck

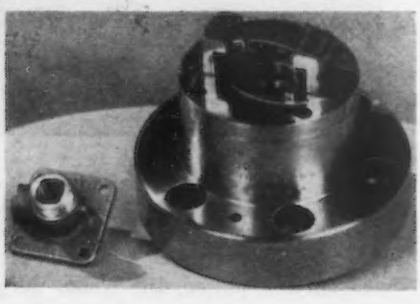
THE "Match-It" gear chuck, announced by *LeMaire Tool & Mfg. Co.*, Dearborn, Mich., is designed to give greater accuracy to holes



bored or ground in gears. It consists of two gripper plates, one stationary and the other movable, each having a set of grippers ground to close limits and positioned accurately. To grip a gear, one plate carrying a set of grippers rotates toward the stationary plate, causing grippers to clamp each side of tooth. Operations such as finish boring, facing, counterboring and grinding and finish shaping one set of teeth from another, as in the case of countershaft or cluster gears, can be performed with the gear chuck.

Finger Chuck

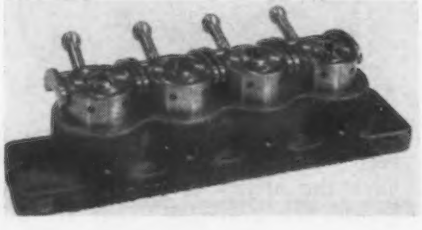
A TWO-JAW compensating finger chuck is being offered by *Anker-Holth Co.*, 332 South Michigan Avenue, Chicago 4. Work is located from a finished round shoulder on the bottom of the casting and by two hardened and ground pins, which also serve as drivers. The jaws are so designed that either one may pull in farther than the other to compensate for varying thickness of rough surface workpieces. The chuck body is made for direct mounting on any American Standard spindle nose, but it can be mounted on any spindle by using an adaptor.



Lever-Type Chuck

THE lever-type Speedichuk, developed by the *General Die-Stamping-Tool Co.*, 265 Canal Street, New York 13, not only increases the collet capacity of ½ in. lathes to ¾ in., but allows the work to be chucked, fed, machined and released without stopping the lathe. Fitting such lathes as the 10 in. Atlas, Logan, 9 in. South Bend, 12 in. Clausing and Craftsman, as well as any other

1½ x 8 thread spindle lathe which has a No. 3 Morse taper on the inside, the Speedichuk requires no drilling or tapping. The floating closing sleeve compensates for any misalinement of the lathe spindle.

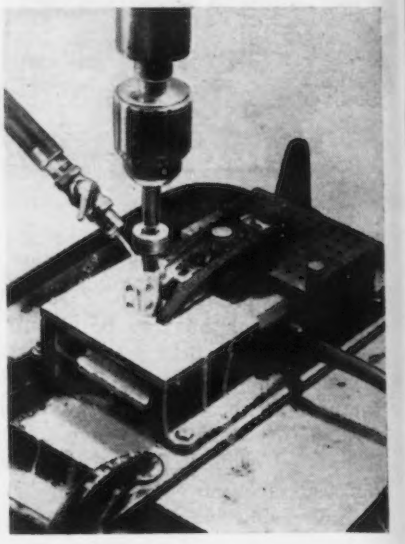


Multiple Collet Holder

A MULTIPLE collet-holder fixture is the latest development of *Zagar Tool, Inc.*, 23880 Lakeland Boulevard, Cleveland 17. It consists of four holding fixtures in either the 1 or 2 in. size, that can be mounted either parallel with or at right angles to the spindle. Two, three or four collets can be used, or multiples thereof. An indefinite number of multiple fixtures can be used at once, the only limit being the length of the table.

Work Holder

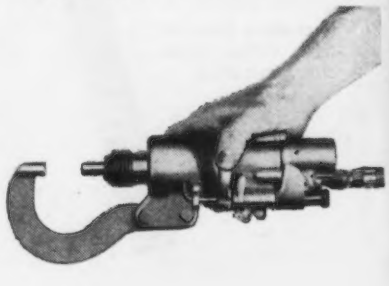
A SIMPLIFIED fixture for holding small flat work has been announced by the *Meade Specialties Co.*, 15 South Market Street, Chicago 6. The "Flat Top" was developed to



overcome difficulties encountered in drilling, countersinking and tapping small precision parts in which highly accurate perpendicularity is essential. It holds any type of work which is flat on the bottom, varying in thickness from a few thousandths up to a couple of inches and in area from the size of a dime up to several inches square. It may also be used for many operations on small shapers and bench milling machines.

Aircraft Riveter

BY means of a yoke, the aircraft riveter put on the market by the *Ingersoll Rand Co.*, Phillipsburg, N. J., does its own bucking up, thereby requiring but one operator. The head is driven to a predetermined height, which is adjustable. The riveter automatically shuts off when this height is obtained. The two-stage throttle enables the operator to aline or inspect the rivet with an initial, partial pressure before driving it home with full pressure. The Air-Buck can be used wherever aluminum rivets up to 7/16 in. must be driven and where it is possible to use a yoke-type tool.



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It is easy to work in any of its forms; and, with standard tool equipment, this advantage can be translated into definite economies. Long runs, high speed machinery and multiple operations—all of these spell reduced time losses, less tool breakage, closer tolerances with less adjusting time.

Because of its fine surface finish, it is ideal for plating. It has a surprising "warm" color range. And color alone is frequently a valuable sales point for any finished product.

And whatever your finished product may be, it's bound to last longer and look better in consequence of being made from brass.

• • •

While we speak of brass above in a generic sense there are actually many brasses for a wide variety of applications both for primary use and fabrication. For a summary of various brasses offered by Revere write for our new 54 page manual—"Revere Copper and Copper Alloys—Technical Information for Product Designers". This manual not only sets forth the specific qualities and properties of the various brasses but it also contains pertinent illustrated information on the whole range of Revere Copper and Copper-Base Alloys. Contains 106 graphs relating to metallographic properties in varying combinations, together with new easy-to-read chemical and physical properties chart. Send for your complimentary copy today. Address Executive Offices.

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• Automobile executives prepare briefs for WPB, whose agenda indicates possibility of passenger car output before complete ending of war . . . GM ideas outlined in report.

DETROIT—Automobile company executives began this week to translate into compact outlines their thinking and paper work dealing with postwar passenger car production resumption. They will present their summaries to the Automotive Branch of WPB in Washington starting April 17. Out of those deliberations may come a program for partial resumption of automobile production at the conclusion of fighting in one of the two major theaters—European and Pacific—in which we are now engaged.

This appears a likely conclusion to the conference, because one of the studies that automobile company executives have been asked to bring with them to Washington is the minimum number of cars which they would be interested in making. The figures of each concern will be tallied. The logical thing to expect out of this phase of the meeting is that when materials, manpower, and facilities required for production of that total—probably around 2,000,000 vehicles—becomes freed of war work weight, then passenger car resumption will in all probability be authorized. And it is reasonable to believe that the termination of one of our two wars will mark that point.

But WPB makes it very clear that no definite time can be set today on any resumption, partial or complete. The forthcoming meeting does not indicate "a prospect of resuming production at any time which can now be determined," the companies were told. In other words, the meeting can be regarded as a beginning to the beginning. And, as such, the subject matter can be fairly well anticipated.

Presidents of all companies engaged in passenger car output at the war's onset will participate in these deliberations, indicating the importance which can be attached to it. Virtually 100 per cent participation in the meeting seems assured.

THESE officials will go down to Washington in a collectively cheerful frame of mind. Although details of the conference framework are restricted, the automotive reaction to them is not; and the reaction is good. "Sensible, down-to-earth thinking," is the general characterization.

All problems governing resumption of passenger car production will be widely canvassed. The discussions will center around regulations, manpower, materials, and facilities.

In all certainty, one of the first topics on the agenda will be the company ideas on regulatory measures necessary in reconversion. Allocations of materials and equipment under government authorization will be taken up; the executives will express themselves on the need—or lack of need—of such regulations.

Settled policy will likely be dedeveloped on the score of manpower. This will include such problems as how to maintain employment during the reconversion period, and how to regulate the assigning of skilled personnel to developmental work which must necessarily precede production.

THERE will obviously be extensive discussion on the topic of facilities required for production. Under this heading some such considerations as government-owned buildings and what to do with them—whether companies will be able to purchase them quickly when they are wanted—and what disposition will be made of plants built within privately-owned properties, surrounded by privately-owned facilities, which impair prewar manufacturing setups.

This phase of the discussions will undoubtedly go into the requirements for machine tools, dies, fixtures, and jigs. The scope of corporate requirements will probably be outlined, as well as the usability of government-owned equipment which will become idle. Ideas on removal of restrictions on purchase of such requirements, and how to arrange the elimination of such rules, will probably be put forth. On this same subject, the withdrawing of government-owned equipment from private plants will be studied from standpoints of removal speed necessity and account terminations.

So, too, for materials. The auto companies will probably outline their ideas on how much tonnage of metals they require for experimental work, and how much advance work they can do and would like to do on paper and in metal.

This is about the form the discussions are expected to take in Washington. As all companies bring in their viewpoints on those matters, WPB will attempt to unify them into a broad program, and utilize the industry blue print in the drawing of a master plan.

Quite obviously, this likely program for the meeting points to a close liaison between industry and government in the interim changeover period, and probably in the full reconversion period as well. But, equally obviously the inference is that industry will tell what it wants, and government will attempt to bring the the objectives within reach.

A FAIRLY good forecast of the philosophy of the General Motors brief for this meeting was conveyed this week in the portion of the annual report of that company, dealing with reconversion problems.

Here are some of the remarks in Chairman Sloan's message:

"It would be most constructive if the government could establish policies and outline procedures at the earliest possible date as affecting disposal of plants now operated but now owned by General Motors. It would then be possible to determine to what extent, if any, these plants can be integrated into the corporatoin's postwar expansion plans.

"Disposition must be made of thousands of government-owned machine tools before plants can be cleared for the postwar re-establishment of normal manufacturing operations.

"Many of the 3100 peacetime machine tools sold to other producers were key machines. They must be replaced or recovered before production of peacetime goods can get started. In addition, wartime developments have paved the way for new types of equipment. It is hoped opportunity will be provided, as the machine tool industry is relieved from war

JEWELS For Sale
A recent visitor stood wide-eyed amid hundreds of racks of gleaming small tools in our final inspection department. He said, "It is difficult to realize that these thousands of sparkling pieces of metal are tools — they look more like jewels."
Small wonder he felt that way. For each one is a jewel of precision workmanship, top-notch metallurgy and perfection of finish. That is the way we've made P&W cutting tools for more than 84 years. Mechanics in every civilized country have come to know and like P&W Small Tools for their quality, long life, and dependable performance. If you use small tools, try these "jewels." They can increase your production and reduce your small tool costs. For details, get in touch with the nearest P&W branch office, listed below:
Shown here are P&W Expansion Reamers— one of many items in the complete line of Pratt & Whitney quality small tools.
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SHOOTING FOR CONSERVATION: *Movie cameras were used for Air Force "shooting" in Detroit recently when a Wright Field photographic crew took shots at Wolverine Tube Division for a conservation movie to incorporate ideas of Wolverine and four other companies. The movie will be shown to industrialists throughout the country.*

work, to give orders for replacements and such new equipment as may be needed.

"General Motors has on hand about $500,000,000 of wartime inventories, mostly work in process and raw materials. Practically none of the work in process and only a limited part of the raw material will have any value in the corporation's peacetime manufacture. Almost all of this inventory must be removed from the plants before new stocks of material required for peacetime production can be accumulated.

"While the basis of the first postwar automotive production must be existing models, it is important, not only in motor cars but in all industrial products, that every effort should be put forth to make available to the public advanced designs at the earliest time practicable. To facilitate this most desirable objective, it is essential that development work in the design of new products and in the redesign of existing ones be inaugurated as soon as materials and manpower can be released for experimental projects. The winning of the war is and always will be the prime objective until the war is actually won, but proper and intelligent planning for reconversion constitutes an essential policy for the longer term."

Detroit-Reliance Merger Consummated

Detroit

• • • **Details of** the merger of the Detroit Steel Corp., and Reliance Steel Corp., were recently made known by W. C. Schrage, president of the former company. The consummation of this merger is subject to approval by two-thirds vote of the stockholders of each of the concerns at special meetings that will be called for this purpose.

Detroit Steel Corp. operates a plant in Detroit, specializing in the manufacture of cold rolled strip. It also operates the Crains-Schrage Steel Co., as a subsidiary in Detroit, engaged in warehousing.

Reliance Steel Corp., has its principal offices in Cleveland and is engaged in warehousing.

Under the merger plan, there will be issued debentures and common stock to the stockholders of each of the companies. Detroit Steel Corp.'s stockholders will receive $10.00 in principal amount of debentures and one new share of common stock in exchange for each share of common stock that they now hold. Reliance Steel Corp.'s stockholders will receive $3.33 1/3 in principal amount of debentures and 0.85 of a share of new common stock for each share of Reliance stock which they now hold.

Stainless Steel Company Formed

Cleveland

• • • **The Ohio Stainless** Steel Co. has been organized by Paul Keller and E. B. Farris with offices in Cleveland, to specialize in all types of stainless steel products, including bars, plates, special shapes, strip, sheets, wire and tubing. The company also will handle stainless-clad sheets and plate, as well as stainless and heat-resistant castings.

A number of companies producing stainless steel will be represented by the Ohio company in the Central West including the Jessop Steel Co., Washington, Pa.; Joslyn Mfg. & Supply Co., Chicago; Babcock & Wilcox Tube Co., Beaver Falls, Pa., and others.

Mr. Keller formerly was associated with the Copperweld Steel Co., Warren, Ohio, as sales manager of tool, stainless, and special steels. Prior to joining the Copperweld, he represented the Bethlehem Steel Co. in Cleveland in a sales capacity for a number of years.

Mr. Farris was assistant district sales manager at Cleveland for Copperweld and previously had been associated with Edgar T. Ward's Sons Co.

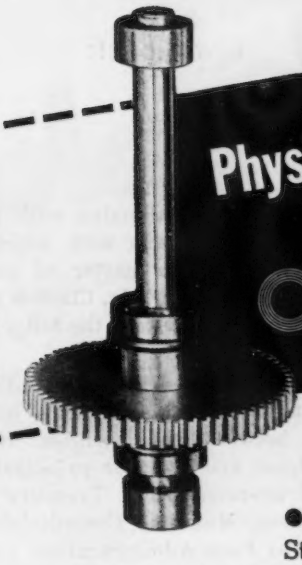
SAE Aeronautic Meeting To Be Held April 5 to 7

New York

• • • **The SAE National** Aeronautic Meeting scheduled for April 5, 6 and 7 at New York, will be the first of 10 national technical meetings, each keyed to a war engineering theme, on the 1944 meetings program of the Society of Automotive Engineers. Guest speaker at the SAE National Aeronautic Meeting will be Maj. Gen. Frank O'D. Hunter, USAAF, commanding, First Air Force, Mitchel Field, Long Island. He will address the Thursday evening dinner on "The Army Air Forces in the Present War."

At the dinner the Wright Brothers Medal, annually awarded to the author of the best SAE meeting paper on aerodynamics, structural theory, airplane design or construction, will be presented to C. E. Pappas, of Republic Aviation Corp., Farmingdale, L. I. Technical papers will be presented at the daily sessions of the conference.

CORROSION is ONLY the HALF OF IT



Physicals and Fabrication are the OTHER HALF

Here's what you get with CARPENTER STAINLESS STEELS

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- Rigidity
- Heat resistance
- Fatigue resistance
- Wear resistance

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- Cleaner blanking
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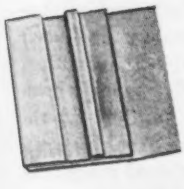
- Faster machining
- Better finishes
- Lower unit costs

● The war has taught us how indispensable Stainless Steel is for thousands of vital operating parts that *must* battle corrosion and heat.

And the outstanding war performance of modern weight-saving Carpenter Stainless Steels is dramatic proof of this metal's exceptional physical properties—its positive corrosion resistance—extra hardness—scale resistance—high strength/weight ratio, etc. At the same time, production men know from war experience that they can meet high output schedules, and do it economically, because of the easier working properties and high uniformity of these Stainless Steels.

Is the Stainless you are using inadequate to meet certain exacting requirements and conditions? Are you enjoying the production economies of Carpenter Free-Machining Stainless, or soft and ductile Carpenter Stainless Strip in your present operations? Talk it over with your Carpenter representative. He is trained to help you select the right Stainless Steel and to solve Stainless fabricating problems.



Complicated forming and bending operations can be done more *easily* and more *accurately* with uniform Carpenter Stainless Strip. And this Stainless will help you reduce costs on today's and tomorrow's jobs.

These valve parts must be free-acting and give long, continuous service on the job. Free-Machining Carpenter Stainless No. 5 met these requirements and cut fabricating costs to a minimum.

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Washington . . . .

L. W. MOFFETT

• Clayton reveals views on disposal of surplus property, giving insight into magnitude of his new job . . . Extent of his authority over contract terminations is in doubt.

WASHINGTON — After a month's operation Will Clayton's Surplus War Property Administration appears headed for a rocky future. Mr. Clayton's testimony before the House Banking and Currency Committee and a special postwar committee revealed many sound principles which he hopes to carry out, but also showed up legal pitfalls and questions of divided authority that will bedevil SWPA.

Appearing before the Banking Committee, which is considering HR 4420, the former Texas cotton merchant said that he was not prepared to comment on the proposed legislation nor was he ready to suggest any legislation that would aid him in the task of disposing of huge postwar surpluses.

HR 4420, which superseded HR 3873, would turn the disposal authority over to RFC, with policy drawn up by a Surplus Property Board, on which business would be represented. Amendments to the bill which required its being rewritten include a clause which excludes ships and real estate for the provisions of the legislation. Another new clause would limit purchasers of surpluses in any one year to a quantity of surplus goods not larger than the quantity of similar goods handled by the purchaser during the year immediately preceding Dec. 7, 1941. Discharged members of the armed forces, who wanted to buy surpluses, would be exempt from this provision.

Beyond saying "that for the most part the provisions of the bill follow pretty closely, I think, the Baruch-Hancock report, and follow pretty closely my own thinking with reference to the aspects with which the bill deals in the matter of surplus property disposal," Mr. Clayton would not commit himself on the bill.

THE Surplus Property Administrator sees himself as a middleman between the agencies owning surpluses and the four principal disposal agencies, RFC, Treasury Procurement, Maritime Commission and the War Food Administration. SWPA will handle general policy and supervision, but will stay out of actual administration as much as possible.

Mr. Clayton will require all agencies to keep adequate inventories and make these inventories available throughout the government to do away with the practice of one agency buying the same material that is being disposed of as surplus by another group.

For the present disposal agencies have been told to continue their past practices in selling, until SWPA can set up general policies. However, these agencies have been told not to sell until they have tested the market, to sell to small buyers and to get fair prices.

Mr. Clayton says that SWPA will attempt to induce the Army and Navy to dig deep into their stocks and locate surpluses, so they can be sold now, thereby lessening the load in the postwar period. Considering the Army's reluctance to permit any return to normal civilian conditions speculation is rife as to how far this plan will get.

To keep surpluses out of the hands of speculators SWPA will instruct the disposal agencies to investigate all prospective purchasers to see that they are reputable, established business men.

In reply to questions regarding surpluses in foreign countries the Administrator told Congress that these surpluses will be disposed of by FEA, under policies laid down by SWPA. Mr. Clayton thinks that larger quantities can be disposed of through Lend-Lease and United Nations Relief and Rehabilitation Administration. UNRRA distribution policies will be fixed by AWPA.

The Surplus Property Administrator would have no objection to dumping surplus combat materials into the ocean, provided the cost of disassembly and preparation for scrap would be greater than the return the scrap would bring.

BECAUSE of the immensity of the task selling will be carried out on a regional basis. In most cases Mr. Clayton expects the property to be sold where it is stored. Materials will be cataloged only where it is feasible and where the disposal operation will not be retarded.

The Surplus Property Board set up in the executive order, which established SWPA, is now meeting weekly in an effort to establish policies. Committees to deal with individual problems will also be set up. The first of these is now in operation and is concerned with the disposal of surplus aircraft equipment. These committees will be advisory and deal only with their particular lines, such as machine tools, electronic equipment and aircraft. Mr. Clayton said that no attempt would be made to police every sale and admitted that there would be abuses in an operation of this tremendous size.

For the duration, and so long as materials remain scarce, SWPA will abide by WPB priorities and allocation regulations. No policy has been established for the disposal of ships, but Mr. Clayton did offer some views on plant disposal. He said he would have no objection to breaking up plants and selling individual machines and shops to get purchasers. Possible future use would be considered before it was decided to sell or dismantle a plant. According to Mr. Clayton his agency does not have the power to say whether the government should operate or dispose of a plant. He presumed this authority would rest with the Army and Navy, or whatever agency constructed the plant.

In reply to Congressional queries as to the feasibility of cutting off the source of supplies, while disposing of surpluses, Mr. Clayton would not commit himself.

SWPA is also making a survey to determine what government institutions, federal, state and local, can use surplus materials to ease the load on consumer markets. Consideration is also being given to selling goods on credit to facilitate the widest possible distribution. Mr. Clayton thought this would require legislation.

He has emphasized repeatedly that

● Efficient, economical fettling of an electric furnace calls for a smaller-sized refractory than the standard open hearth clinkered dolomite. Syndolag was designed to meet that need. It is a rice-size material, of sharp angled grains, carefully proportioned as to size and free of fines.

Since its introduction in the rice-size two years ago, Syndolag has grown steadily in favor in electric furnace shops. Operators who use it like it for these unique properties:

1. Sharp angle of repose—The small, angular grains stay in place well on steep slopes, instead of rolling down the banks to pile up around the edges of the flat. This cuts down fettling time, reduces refractory consumption and protects the capacity of the furnace.

2. Rapid heat absorption—Small grains absorb heat more quickly than larger grained material. This is especially important in the electric furnace where only residual heat after tapping is available to set a refractory.

3. Quick consolidation—Syndolag's small grains set up quickly into a dense, homogeneous patch which does not cut out readily or loosen easily—a valuable asset for top charged furnaces.

Syndolag has the same desirable chemical and mineralogical properties that have made Magnefer so successful for open hearth maintenance. Both refractories are produced at our modern plant in Northwestern Ohio, located near the geographical center of the steel industry. Adequate stocks are maintained, so that we can take care of your immediate needs with prompt rail shipments.

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his agency would try to avoid getting into administrative work, but that owning agencies would report their surpluses directly to the disposal agencies, whose sales would be checked by SWPA men.

THERE is considerable proposed legislation on Capitol Hill which would wipe out SWPA, and set up a group to dispose of surpluses, responsible to Congress and not the executive. This is an outgrowth of the feeling that the President has ignored the Congress in establishing SWPA.

Mr. Clayton is not sure whether he has authority over all contract terminations. He is making plans to confer with the Army, Navy and the Joint Contract Termination Board but beyond that the water is muddy.

There could also be conflicts between existing statutes and any policies that Mr. Clayton might set up. For example, RFC and its subsidiaries have been set up with the power to buy, store and dispose of certain materials within statutory limitations. Should a dispute arise it is questionable as to who would prevail. It is situations of this sort that lead observers to believe that the job will be taken out of Mr. Clayton's hands under legislation to be passed by the Congress, allowing for all existing laws and repealing any that might be necessary.

In the field of disposal of government real estate there are some 150 different statutes involved. Mr. Clayton has established a committee, headed by the Attorney General, to check these statutes and determine whether any new laws are needed.

Much doubt has arisen as to whether the Army will bow to Mr. Clayton's organization, or continue to dispose of its surplus materials throughout the country as it has been, resulting in sales, such as the machine tool sale in Detroit, and the more recent sale of batteries in Utah.

o o o

Navy Adopts Termination Clause

Washington

• • • **Insertion** in all fixed-price supply contracts of the uniform termination article as approved by the OWM has been directed by the Secretary of the Navy as a means of expediting negotiation of terminated contracts. All Navy contractors were urged to contact the Navy procurement branch having major interest in their operation and arrange for inclusion of the article in their contract.

Each Navy Department Bureau, as well as the Marine Corps and the Coast Guard, has established one or more Review Boards to analyze proposed contract termination settlements for the protection of the Government's interest.

Procedure as set up by the Navy for settlement of terminated contracts delegates the responsibility of negotiation to the contracting officer of the Bureau with dominant interest. An official review of each claim is to be made by qualified personnel.

THE BULL OF THE WOODS — BY J. R. WILLIAMS

THIS CALLS FOR AN ANSWER-- WILL YOU GET ME A PEN AN' INK?
IT'S TIME FOR YOUR MEDICINE NOW--HERE'S THREE MORE TELEGRAMS AND A BOOK--AND TH' DOCTOR WILL BE IN TO SEE YOU IN FIVE MINUTES!
THEY PUT TH' BULL O' TH' WOODS IN HERE FER A COMPLETE REST! I THINK HE DID BETTER IN TH' SHOP!
HE HAD A STAFF TO DO ALL THAT STUFF IN TH' SHOP--BUT MAYBE THAT'S WHAT HE NEEDS, IS A LOT O' WORK!
SHOP PRACTICE
BR-R
R-R
J.R.WILLIAMS
HEROES ARE MADE-NOT BORN
T. M. REG. U. S. PAT. OFF. 3-31
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Limited Service Is Favored by Nelson

Washington

• • • **Deploring** the lack of control over 4-F's, men over 38, and those otherwise deferred, Donald M. Nelson, WPB chairman, told a House subcommittee on Draft Deferments on March 24 that he favored some method of utilizing these men in essential industries in the form of a limited service act, but in his opinion "the time has passed" for national service.

The subcommittee is considering two bills introduced by Representative Luce, Republican of Connecticut, which would place these men in a separate corps, either an integral part of the Army or an auxiliary. The legislation would leave men in essential jobs, and place others in industries which needed manpower.

Mr. Nelson said there was a moral obligation on the part of these men to get into essential jobs. He added that it was his belief that the moral effect of legislation such as has been proposed, that is setting up a classification for these men, would induce many voluntarily to get into essential work.

34,662 Tons of Fabricated Structural Steel Booked

• • • **February bookings** of fabricated structural steel for bridge and building construction, reported to the American Institute of Steel Construction, totaled 34,662 tons, compared with 42,454 tons reported in January and 34,657 tons reported for February, 1943. Reported shipments in February amounted to 32,541 tons.

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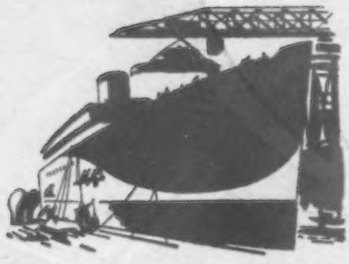
WEST COAST . . . OSGOOD MURDOCK

• Steel foundries, with plenty of orders, can only operate two-thirds capacity for lack of manpower . . . Geneva Works starts rolling plates . . . Bonneville federal power development bids $90,000,000 for utility.



SEATTLE—Where, only a few years ago, a crossroads at the southern end of Lake Washington was called Renton, today there is a bustling, frantically growing industrial outpost with a population nearing 15,000 and two big industries, Boeing and Pacific Car & Foundry.

A new $9,000,000 Federal housing development has just been completed with 2,400 units. This is just beyond the Renton city limits, and already 8,200 persons live there, 70 per cent of them Boeing workers. Schools, stores, utilities, public services and assembly auditoriums are complete. In fact, the tail wags the dog, for Renton itself has a total population of only 6,200, so that most of its residents now live beyond its city limits.

At the Boeing Renton plants, B-29's are being produced. At this important new plant Boeing is 2,000 workers short, and to maintain schedules, before long there must be 15,000 employed. Work on the 29 is heavy, requiring more men and less women than at the Boeing Seattle plants. Even women are scarce and hard to employ.

Last week contracts were let to the Austin Construction Co. to design and build $2,500,000 more in buildings for this plant.

Renton's new airfield runs a mile along beside the plant and is now completed. To build this field it was necessary to fill a huge swamp, fill in part of Lake Washington and move a sawmill and shipyard. Near the mile-long land runway is Lake Washington for seaplanes, and this take-off strip actually determined the location of the plant originally, when contracts for the Sea-Ranger were in prospect.

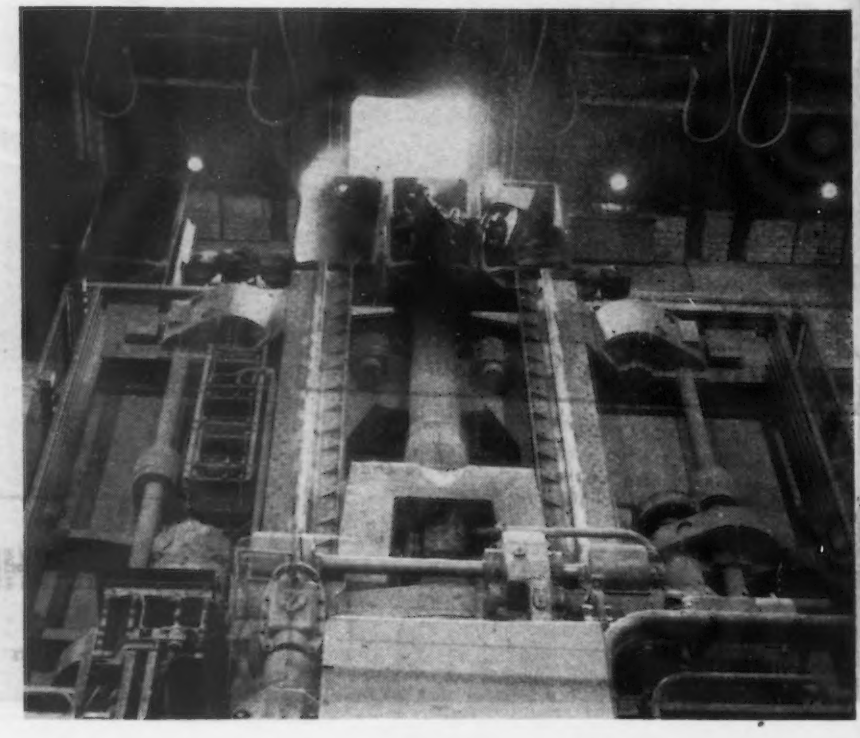
FROM this thumbnail highlight visit to the suburb 10 or 15 miles southeast of Seattle, it is only a few minutes by air across the scenic Puget Sound to Bremerton, 20 miles west of the city. Congestion in Bremerton is quite disreputable and appalling. People live in trailers and shacks, they crowd into one-room homes and overflow the sidewalks. Yet over across a lovely inlet, only a few miles by skiff or ferry and but 12 miles by convenient highway bus, are 5,554 housing units in the East Port Orchard and Orchard Height developments, of which 3,460 or 65 per cent are vacant. On the basis of Renton's 8,200 persons in 2,400 units, Bremerton's unoccupied houses should provide accommodations for over 10,000 persons. Federal housing authorities are at a loss to account for the vacancies. Only war workers are eligible but surely, they say, all the human sardines packed into Bremerton are not predatory leeches living off the Navy Yard workers and Navy personnel.

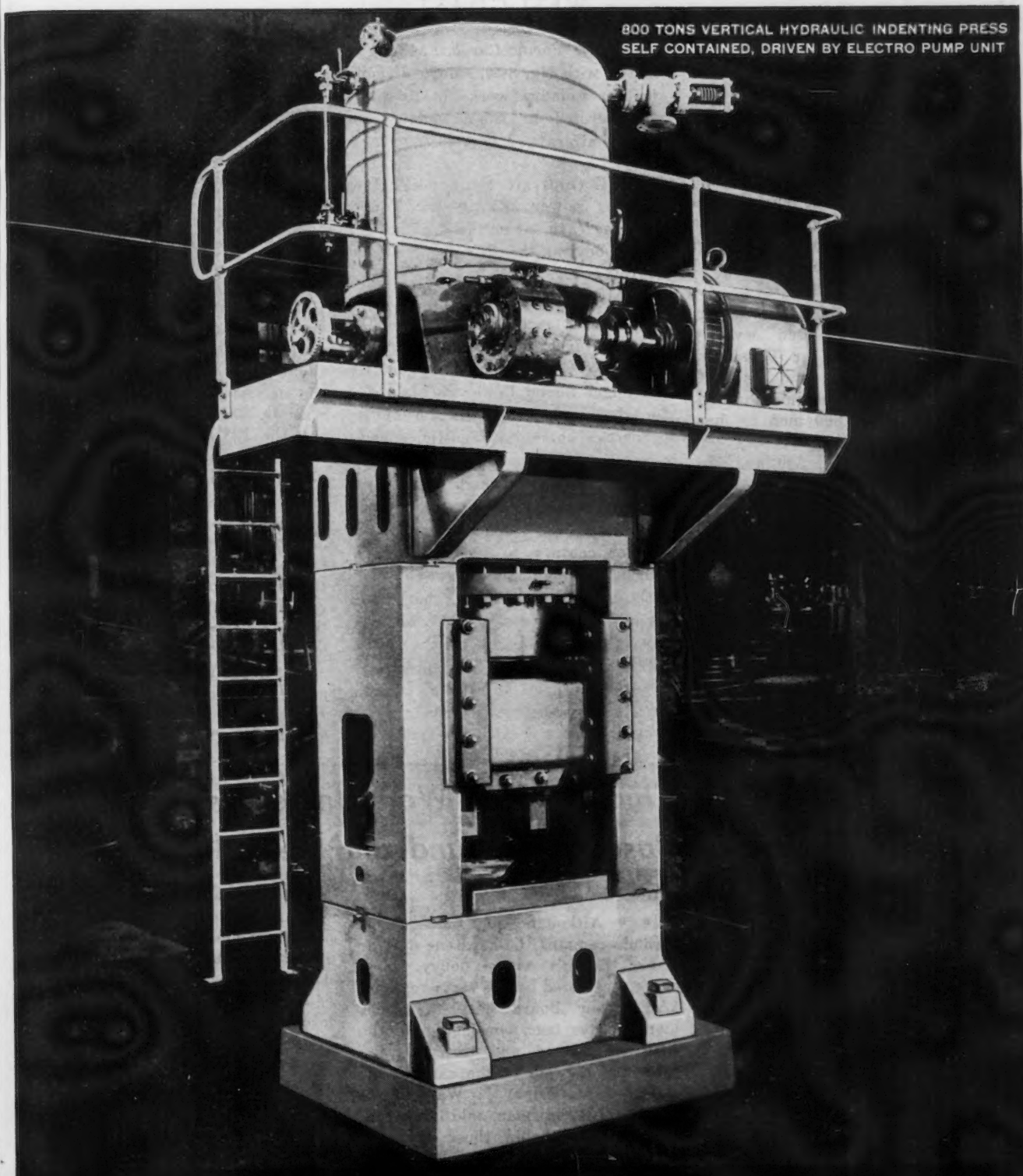
THE plate mill of the government's new $180,000,000 Geneva Steel Co., plant near Provo, Utah, went into operation March 23 when the first trial rolling of plates was made. This plant, the largest integrated steel plant west of the Mississippi River, is being operated by the Geneva Steel Co., a U. S. Steel Corp., subsidiary, under contract with the DPC for war period.

First rolling plates for the Pacific Coast shipbuilding industry culminates a series of operating steps over the past few months which began with the charging of the first battery of coke ovens on Dec. 13, 1943. Two of four batteries of by-products coke ovens, two of three blast furnaces, three of nine open hearth furnaces, the slabbing mill, and auxiliary facilities are now in regular production.

In April, 1942, U. S. Steel's west

• Charging scrap iron in open hearth at new Geneva steel plant.

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coast subsidiary, Columbia Steel Co., began clearing the plant site.

POTENTIAL present capacity of Pacific Coast steel foundries has recently been estimated at a total of some 330,000 tons annually although current operation is not much over a rate of 225,000 tons per year. Since demand is great for steel castings and the trend unmistakable, why only 60 or 70 per cent operating rate?

Manpower is one limiting factor. Columbia Steel has been severely handicapped for men at Pittsburg, Calif., ever since its new big DPC foundry was opened six months ago. Needing less than 800 men to man this plant complete, it has been impossible to recruit over 500, and this inadequate manpower keeps one foundry furnace shut down and restricts operations to two undermanned shifts. Attractive local housing is available and fine fishing and farming are all around. But foundry work is harder and the basic wage scale starts at 78c., competing with 95c. minimum in the shipyards and competitive pressures and inducements by transportation and other highly rated industries with a less rigid and more favorable wage rate. Columbia has carried newspaper display advertising and is placing billboards throughout neighborhood communities but the elaborate referral and priority urgency procedures of the War Manpower Commission and the United States Employment Service seem to retard and divert recruits rather than encourage them. This DPC plant is a main supplier of forgings and steel castings for Maritime and Navy ship construction and persistent delays in schedules and production will be reflected in Victory ship showdowns. But management has found its ratings and referral procedures not sufficiently high nor effective to make it possible to man the plant.

Apart from manpower, terminations have temporarily rendered some West Coast steel foundries idle. The notable instance is Pacific Car & Foundry at Seattle with big, new, enlarged facilities for foundry work but its plant now devoted to sub-assemblies for Boeing aircraft.

BLUE chips are being tossed into the power pot in the Pacific Northwest in a no-limit game for stakes beyond the dream of normal avarice.

When the Puget Sound Public Utilities District recently authorized Dr. Paul J. Raver, Bonneville Power Administrator, to offer $33,000,000 to the Puget Sound Power & Light Co. for the purchase of certain of its properties outside of Seattle, normal citizens, taxpayers and public utility experts whistled through their teeth and gathered round the table. It has taken the city of Seattle almost a quarter century to recover from a $25,000,000 municipal street-car deal with Stone & Webster, but hope springs eternal in all human breasts, especially when stakes are out of the public treasury. PUD wanted distribution properties within the 18 counties served by the private company but not generating or transmission facilities nor the distribution system in Seattle.

Puget Sound P. & L. flickered never an eyelash and announced with a straight face that it would "give earnest consideration to any fair proposal for the acquisition of its electric properties as an entirety . . . the company has received no such proposal."

Long experienced in tossing seven, eight and nine digit commitments about and backed by the Federal Treasury, Dr. Raver promptly called the pass of President Frank McLaughlin of Puget Sound Power & Light "We offer $90,000,000 for all the electric properties of your outfit," was Mr. Raver's no-limit raise, including the $33,000,000 for the outlying distribution, $27,000,000 for Seattle city distribution and $30,000 for generating and transmission facilities. So it looks as if the original yardstick development at Bonneville and Grand Coulee may become such a bludgeon that there won't be a vestige of private competition left. When and if that day comes, electric power may be scott free as a Federal bounty or it might be higher than the low competitive rate in the past. But in any case the implications of a deal of this magnitude are considerable.

Chicago Area Wage Increases Based on "Sound and Tested" Rates

Chicago

• • • Although the "Little Steel" formula remains the keystone of War Labor Board's wage policy, most cases considered by the sixth regional War Labor Board here in recent months have been considered on the basis of "sound and tested" wage rates for the job in the same labor market area, Edgar L. Warren, regional WLB chairman, said last week.

Wage rates below those adjudged by the regional board to be "sound and tested" for a given job in the labor market area may receive favorable consideration from WLB for upward adjustment upon proper application. "Sound and tested" rates represent some point below the average, usually about 10 per cent, it was pointed out. Warren explained that the philosophy of giving favorable consideration to such adjustments involved a desire to remove the worst injustices, rather than to equalize all wage rates.

"Sound and tested" rates, Warren explained, are set up by the regional WLB for key job classifications in its market areas on the basis of a great mass of statistical data gathered from the Bureau of Labor statistics, employers' groups, WLB case files, and other submitted data. (Ed.: Such wage brackets have not been established for many job classifications and gathering the necessary data to establish them may involve lengthy delay.) Warren said the board may revise these rates on its own initiative in the light of further experience and data and suggestions for revision are welcomed by the board when accompanied by "sound and representative" data.

. . . Cited for Awards . . .

• • • **The following** companies have won the Army-Navy E award for outstanding war production:

Buffalo Pumps, Inc., North Tonawanda, N. Y. (third star)
Divine Brothers Co., Utica, N. Y. (second star)
Heller Brothers Co., Newcomerstown, Ohio (first star)
Verson Allsteel Press Co., Chicago
Bliss & Laughlin, Inc., Harvey Plant, Harvey, Ill.
Glidden Co., Metals Refining Co., Hammond, Ind.
Illinois Watch Case Co., Erie Basin Metal Products Co., Elgin, Ill.
Poray, Inc., Chicago.
E. M. Weymer Co., Inc., Chicago.
Woodruff & Edwards, Inc., Elgin, Ill.
American Bridge Co., Gary, Ind.

TOCCO is pleased to announce the opening of its new Research Laboratory . . . the largest one of its kind in the world . . . devoted entirely to the solving of Industry's problems in induction heating . . . hardening, annealing, brazing and heating for forming.

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Write for free booklet, "Results with TOCCO"

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PERSONALS

• **Charles M. Kay,** division metallurgist of the American Steel & Wire Co., Worcester South Works has been promoted to the staff of the Cleveland works.

• **C. Francis Cowdrey, Jr.,** contract specialist of the Smaller War Plants Corp., has been made general manager of the Harrington & Richardson Arms Co., Worcester.

• **Edward F. Whittemore** has been appointed purchasing agent for the American Welding & Mfg. Co., Warren, Ohio. He brings nine years of purchasing experience to his new connection.

• **H. H. Smith** has been made assistant manager, metallurgical department of the American Steel & Wire Co., Cleveland, subsidiary of U. S. Steel Corp. He replaces the late Lawrence H. Dunham who died in January of this year. Mr. Smith became associated with the Wire Co. in 1928.

• **Vincent Manka** has been appointed assistant to the president of Claud S. Gordon Co., Chicago, Ill.

• **Dr. George E. Hulse** has been appointed research director of the Gould Commercial division, National Battery Co., Depew, N. Y. He formerly was physical researcher for U. S. Rubber Co., Passaic, N. J.

• **Oscar Seidel** has been appointed manager of structural fabricating division of the American Bridge Co., Ambridge, Pa., plant. He succeeds the late David L. See. Mr. Seidel was general superintendent of the hull division at the Ambridge shipyard since February, 1943. He has been with American Bridge since 1915.

• **John B. DeWolf** formerly associated with the Jones & Laughlin Steel Corp., has been named vice-president in charge of sales for the Woodward Iron Co., Birmingham.

• **J. H. Wood** has been appointed to the sales staff of the hydraulic press division of the A. B. Farquhar Co., York, Pa. Mr. Wood's headquarters will be in Philadelphia.

FREDERICK E. MOSKOVICS, industrial consultant, A. O. Smith Corp.

• **Frederick E. Moskovics** has been appointed industrial consultant of the A. O. Smith Corp. of Milwaukee. For the past three years Mr. Moskovics was technical advisor to the supervisor, Army Air Forces, where his cooperation with industry was one of the major factors in this country's phenomenal plane production.

• **Harold P. Ackerman,** who has been with the valve department of American Car & Foundry Co. since 1933, has been appointed assistant manager to William R. Kottsieper. In his new capacity he will have charge of sales promotion in the eastern states.

HAROLD P. ACKERMAN, assistant manager to William R. Kottsieper, American Car & Foundry Co.

• **Nicolas Baklanoff,** engineer and linguist, has joined the staff of Battelle Institute, Columbus, Ohio, to serve as a translator of technical literature and patents and to conduct literature research in foreign languages. **Samuel L. Case,** formerly technical advisor, Jones & Laughlin Steel Corp., Pittsburgh, has been made research metallurgist. At Battelle he will be engaged in research in process metallurgy.

• **Dar Johnson,** formerly with the Peoria, Ill., *Journal-Transcript,* has been made sales promotion and advertising manager of the Willamette Hyster Co., Portland, Ore., and Peoria.

• **Richard J. Ruff** has been appointed sales manager of Young Brothers Co., Detroit. He succeeds Robert B. Reed who has resigned.

• **Allan B. Hendricks, Jr.,** who designed the first million-volt testing transformer equipment used in General Electric's Pittsfield Works, has retired from the company after 43 years of service in lightning research.

• **Ellis L. Spray** has been named assistant to the president in charge of the headquarters manufacturing division of Westinghouse Electric & Mfg. Co., Pittsburgh. He will be in charge of the company's manufacturing divisions, quality control, and methods of production.

• **Grant Fitch,** head of the Ishpeming, Mich. sales office of the Westinghouse Electric & Mfg. Co., has been transferred to the Milwaukee office.

• **Fred E. Laig,** former head of the methods and equipment department of the Edward G. Budd Mfg. Co., Philadelphia, has been appointed to the staff of Mr. Budd, Jr., in connection with the production of the company's cargo plane. **Douglas Craig** has a similar position pertaining to cargo plane costs. **John Fetcher** succeeds Mr. Laig and **Robert Phair** has been named chief electrical and welding engineer.

• **Knox Ide,** president of American Home Products Corp., has been elected a director of American Machine & Foundry Co., New Haven, Conn., and its subsidiary, International Cigar Machinery Co. Mr. Ide fills a vacancy created by the death, last year, of **Rufus L. Patterson,** founder of the company.

CORLISS A. BERCAW, assistant general manager, Elliott Co.

• **Corliss A. Bercaw** has been appointed assistant general manager of the Springfield, Ohio, division of Elliott Co.

• **George A. Dusenbury** has been named assistant manager of the Allis-Chalmers advertising and public relations department, Milwaukee. Mr. Dusenbury came to Allis-Chalmers from the company's agency, Compton, and has been advertising copy supervisor for the past year. He has worked in the copy department of the Plymouth division of Chrysler Corp. and was previously associated with Ross Roy, Inc., J. Stirling Getchell, Inc., and Compton advertising agencies.

• **Jack L. Straub** has been elected chairman of the board of Bearings Co. of America, Lancaster, Pa. **Henry W. Jackson** has been elected president; **Charles D. Addams** and **John I. Hartman**, vice-presidents; **E. E. Marshall**, secretary-treasurer and **Oliver J. Swartz**, assistant secretary-treasurer.

• **J. W. Lawton**, has been elected vice-president and secretary of South Chester Tube Co. and its wholly owned subsidiary, Chester Tidewater Terminal, Inc. of Chester Pa.; **R. F. Bradshaw**, has been made treasurer and assistant secretary and **N. G. Kriebel**, assistant treasurer.

• **John H. Elliott** for the past four years secretary, Landis Machine Co., Waynesboro, Pa., has been appointed general manager. Mr. Elliott will continue his duties as secretary.

• **H. W. Whitmore** has been appointed chief engineer of the Kold-Hold Mfg. Co. of Lansing, Mich., succeeding **R. H. Swart**. Mr. Whitmore comes to Kold-Hold from the Automatic Products Co. of Milwaukee.

• **G. E. Hunt** has been appointed acting manager of the Atlanta territory of Cutler-Hammer, Inc., Milwaukee.

• **Frank R. Benedict** has been appointed manager of the product performance analysis section at the East Pittsburgh plant of the Westinghouse Electric & Mfg. Co. As head of this newly-created section Mr. Benedict will work under direction of **M. B. Wyman**, manager of the district engineering and service department. He was formerly manager of engineering and service in the New England area.

• **J. H. Thompson**, vice-president of the M. A. Hanna Co., Cleveland, has been named director of the newly created division which consolidates the lake coal, iron ore, dock and vessel departments. **H. L. Pierce** has been named executive vice-president of the various iron ore mining subsidiaries in charge of mine operations and sales.

• **Herman A. Griebenow** has been appointed superintendent in charge of factory operations of the Union Brass & Metal Mfg. Co., St. Paul.

• **T. W. Korb**, counsel for Harnischfeger Corp., Milwaukee, has been elected assistant secretary.

• **Charles S. Mattoon**, manager of industrial relations of the Curtiss-Wright Corp. Airplane Division, Buffalo, has been named permanent chairman of the industrial relations committee of the Aircraft War Production Council, East Coast, Inc.

• **Alexander M. Hamilton** has been appointed vice-president, foreign sales of American Locomotive Co., New York.

• **R. K. Clifford** has been named vice-president and general manager of Continental Steel Corp., Kokomo, Ind. In 1937 he became works manager of the company and in 1940 he was elected vice-president in charge of operations. He became a director of the corporation in 1941 and a member of the executive committee in 1943.

• **Lewis Walker, III**, has been elected president of Talon, Inc., Meadville, Pa., succeeding **W. C. Arthur**, resigned. **T. F. Soles** has been elected vice-president and chairman and **J. E. Turner** has been elected treasurer.

OBITUARY...

• **John J. Sammon**, for many years superintendent of Hanna Furnace Co. and its predecessor, Buffalo Union Furnace Co., died March 13 at his home in Buffalo. Retired five years, he was 75.

• **Charles W. Landis**, contracting engineer of the U. S. Steel Export Co., New York, died on March 20. He had been affiliated with the company since 1906. Prior to that time, he was a designing engineer for the American Bridge Co.

• **Niels A. Sorensen**, superintendent of the automotive and diesel crankshaft division of The Ohio Crankshaft Co., Cleveland, Ohio, died March 7. He had been connected with Ohio Crankshaft since 1937.

• **M. Beach Helme**, 59, assistant manager, procurement department, Joseph T. Ryerson & Son Co., Chicago, died March 7, following a protracted period of ill health. He had been associated with Ryerson since 1910.

• **Matthew O. Troy**, a commercial vice-president of the General Electric Co., Schenectady, N. Y., died suddenly March 13. He had been with the company for 47 years. In 1923, he became executive assistant manager of the central station divisions, and from this position was promoted first to manager of the division and then to commercial vice-president.

• **Harry G. Bow**, 74, a retired Canton steel sales executive, died March 20. He retired in 1940 after an association of 35 years with major steel companies in this section.

• **William E. Hoblitzelle**, president of Smith & Davis Mfg. Co., St. Louis, died recently. He was associated formerly with Howard Steel Co., Birmingham, Ala., the Commonwealth Steel Co., Madison, Ill., and was a former president of Duquesne Steel Foundry Co., Pittsburgh. He was 73 years old.

• **Septimus H. Griffiths**, 63, metallurgical engineer at the Ohio Steel Foundry Co., Canton, Ohio, died recently.

• **Joseph R. Beaudreau**, chief inspector of the De Soto Division of Chrysler Corp., Detroit, died recently.

Fatigue Cracks . . .

BY A. H. DIX

Postwar Pick-me-up

• • • We see by the papers that the tight little islanders are laying odds that this country will undergo a postwar depression of respectable proportions and are already planning a fire screen to prevent themselves from becoming scorched.

The English have had centuries of experience as global betting commissioners. And while they have made some king-size wrong guesses, their overall record as odds-layers is good, owing to their ability to maintain a non-osmotic wall between their judgment and their affections. Added to that is their way of looking askance at those who abhor their own dismal habit of taking hangover pills by the handful during the very act of acquiring an economic jag.

But the odds are not fixed, and are in fact being favorably influenced at the moment by an increasing disposition on our part to come out from under the bed and take a few swigs of disagreeable but necessary castor oil.

Another happy omen is the interest in the lists of seized foreign patents for metal products running serially in your favorite family journal. (See page 100.) Manufacturers are not waiting until the crutch of government buying is jerked from under them before looking around for something to sell. They are finding these foreign patent lists the postwar product seeker's paradise.

We have published so far about 2500 of them, running all the way from S. Wagner's (Germany) "portable lemon slice squeezer for table use" (Alien Property Custodian No. 2,037,553) to H. Krahn's (Germany) "dust cart adapted to prevent the escape of dust or refuse during the emptying of dust bins or containers into it" (APC 1,776,034).

For a 34-page reprint of all the installments published to date, send 30c. in stamps to us at 100 E. 42nd St., New York 17. If your postwar blues don't evaporate and your heart sing when you look over this list, well. . . .

Full Stop Ahead

• • • People who make speeches know that somewhere near the end it is wise to inject a signal that the conclusion is within sight. Otherwise the audience is given no opportunity to get set mentally for the stop.

The best terminal signal we have ever heard is one used by Channing Pollock. He says, "As Lady Godiva said toward the end of her ride, I am nearing my close."

Freud and Linotype

. . . You may be right in your theory that at the root of every typographical error is a suppressed thought straining for expression. The other day the Birmingham News-Age-Herald referred to Russell Hunt, Sloss-Sheffield's energetic v.p. in charge of sales, as "Hussell Hunt."

—*John McCune, Birmingham, Ala.*

Plug by Principal

My wife, who is a public school teacher, listened to a talk the other day by her principal on how important it is that the children understand the meaning of the words in the textbooks so that they can grasp what they are reading.

Eighty per cent of the words used in the newspapers are taught, he said, in the first, second, and third grades. "But in a trade journal—The Iron Age, for instance—as many as 80 per cent of the words may be technical," he added.

I thought you would be interested.

—*S. D.*

We are—and flattered, too. Four times out of five when you ask a person to name a color, he will say "red." If asked to name an article of furniture, he will say "chair." If flowers are mentioned, rose gets the votes. If you say, "Name a trade paper," your subject has several thousand publications to choose from but nine times out of ten he will name your favorite family journal.

We are not bragging, but are just stating a fact. We are the symbol for our portion of the Fourth Estate, just as the bearded goat is for bock beer.

Fourth Estate's Birth

• • • *Until just a few minutes ago, the Fourth Estate was just a phrase to us. All we knew was that it applied to the publishing industry, and we had not the slightest idea of what the other three estates were. But now we know. The first three estates are Kings, Lords and Commons. The fourth was originally the Mob. Next it was the Army. Finally Macaulay pinned it onto publishing, thus, "The gallery in which the reporters sit has become a fourth estate of the realm." And there it has stuck.*

Perish Forbid

. . . "Your Mar. 16 editorial, "Profits Not Without Honor," reads, "Profits are immoral and unethical only when not earned. Those kind we can eliminate through proper legislation."

Don't you mean "them kind?"

Leave us have better proof reading.

—*John L. Christie, Fairfield, Conn.*

How this speck escaped the whiskbrooms in the brains department and proofroom is among the things we will die wondering about. Maybe someone in the print shop whisked so hard that an "s" was brushed clear off "kinds."

So bright is the light that beats on our president and editor's amber prose that the merest flaw has no more chance of escaping detection than would a rum blossom on Anne Sheridan's beautiful beak.

Sunny Pittsburgh

. . . Your piece on the courteous message the Cooper-Bessemer people give each caller moves me to ask if somebody in that firm is from Pittsburgh. I ask because my researches indicate that Pittsburgh is in a class by itself for distinguished business courtesy.

Once I called on a big firm in Lancaster, Pa. I stopped a vice oresident right when he was about to go into an important directors' meeting. Instead of kicking me out he asked me if ten minutes would do any good, and he gave me fifteen. Then he went into the meeting, which made him president—H. W. Prentis, Jr., of Armstrong Cork.

On the way out I complimented the reception clerk on the firm's manner of handling visitors and said I had not seen such courtesy except in Pittsburgh. "We were formerly a Pittsburgh company," the clerk replied.

—*Deac*

The chances are that what Deac takes for a fact is but a series of lucky coincidences. If, however, he is right and Pittsburgh is indeed a hive of industrial courtesy, we can supply a reason, and this is it: Absence of sun depresses human spirits. The pall that overhangs Pittsburgh makes sunless days the rule. Those who cannot tolerate long periods of gloom move away, leaving only those blessed with an extra supply of good humor.

Puzzles

• • • The three values in last week's cerebral workout are: x equals plus one, y equals plus one-half of the square root of two, and z equals minus one-half of the square root of two.

Dr. Carey P. (Chrysler Corp.) McCord contributes this:

A customer in a store bought a hat for $3.50, but handed the clerk a check for an amount larger than necessary in payment. However, the clerk made an error, reading the dollars of the check for the cents and the cents for the dollars. After deducting $3.50 for the hat, the customer was returned the true value of the check. What was the value of the check?

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There Can Be No Compromise!

There can be no compromise in any industry where fast, accurate, reliable weighing is a factor.

The decision of the scales must be final and absolute . . . with no tolerance for concessions or adjustments due to weighing inaccuracies.

Fairbanks-Morse Scales more than meet that demand. They are accurate. They are reliable. They have been since 1830—when the first Fairbanks-Morse Scale was built.

Today, Fairbanks-Morse Scales are found in every type of industry. They are used not merely as scales, but as highly efficient production tools that speed operations and eliminate costly errors.

Fairbanks, Morse & Co., Fairbanks-Morse Building, Chicago 5, Illinois.

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Scales

Dear Editor:

SHELL CASES

Sir:

In the manufacture of 20 mm. steel shell cases, is it necessary, after the casing has been drawn to full length, to gas-flame or anneal the open end prior to necking or reducing for bullet size? Also, if the case is gas-flame annealed or otherwise annealed, is it common practice to clean the open end to remove any discoloration, scale, or soot which may have accumulated from annealing, before necking or reducing the end of the case?

We understand that during the first few months of production it was the practice to clean after gas flame annealing, but that this has been eliminated. Is this correct?

CHAS. A. DREISBACH,
President
Dreisbach Engineering Corp.,
45 Warburton Ave.,
Yonkers, N. Y.

● It is usually necessary to anneal the mouth in order to meet specifications. To get the proper necking, annealing is ordinarily required. It would be possible, of course, to neck and then anneal to meet specifications, but most manufacturers have found the reverse to be more efficient. As to cleaning after annealing, steel cases are lacquered, and since lacquer will not adhere to dirty steel, cleaning is essential.—Ed.

TRICHORETHYLENE

Sir:

Your Mar. 9 article on Trichlorethylene is most informative and shows that the writer has given more thought to the problem of degreasing and the use of chlorinated solvents than is customary. Too often supervision is inclined to regard it as a nuisance operation and thereby lose some of its greatest advantages. . . .

ROSCOE STOVALL
Mitchell-Bradford Chemical Co.,
2446 Main St.,
Bridgeport, Conn.

Sir:

We are interested in obtaining a number of reprints of your Mar. 9 article, "How to Use Trichlorethylene Solvents." Our company has been selling trichlorethylene for a long period and it is our opinion that Mr. Hines' article describes as well as anything we have read the characteristics and uses of this solvent.

S. G. THORNBURY,
Technical Director
Turco Products, Inc.,
P. O. Box 2649 Terminal Annex
Los Angeles 54

Sir:

I am interested in receiving four tear sheets of the article, "How to Use Trichlorethylene Solvents." Please advise immediately should this request be one you are not able to comply with.

E. H. NELSON,
Processing Engineer
Automatic Products Co.,
2450 North 32nd St.,
Milwaukee 10, Wis.

● Tear sheets have been sent.—Ed.

CASTING INSPECTION PRICES

Sir:

We are much interested in the story, "Steel Casting Inspection Ceiling Prices Established," on page 84 of your Mar. 9 issue. Can you tell us where we may obtain a copy of the order?

W. E. THOMAS,
Second Vice-President,
Magnaflux Corp.,
5900 Northwest Highway,
Chicago 31

● The information was contained in the OPA release No. OPA-T-1800, Amendment 11 to Revised Price Schedule No. 41.—Ed.

NOISE MEASURER

Sir:

In a recent issue you mentioned Dr. E. J. Abbott as having developed a noise measurement technique used in checking ball bearings. What is Dr. Abbott's address?

F. H. PILLSBURY,
Standards Dept.
Century Electric Co.,
St. Louis 3, Mo.

● Physicists Research Co., 343 South Main Street, Ann Arbor, Mich.—Ed.

NEWS FRONT

Sir:

We have been most interested in your recent page entitled *News Front* and wish to express our appreciation of this service.

May we inquire whether it would be possible to change the location of this page so that we can clip it without destroying what is usually your leading article?

EARNSHAW COOK,
Chief Metallurgist
American Brake Shoe Co.,
Metallurgical Dept.,
Mahwah, N. J.

● Because of its name and nature ***News Front*** is placed at the beginning of the editorial section. We could back it up with an advertisement but then we would not be able to start the first article with a double-page spread. It *is* a problem.—Ed.

COMPARABLE ELECTRODES

Sir:

Will you please send me some copies of "Comparable Arc Welding Electrodes" chart on your May 13, 1943, issue.

G. W. HOSKINS
Harnischfeger Corp.,
Broad Street Station Bldg.,
Philadelphia 3, Pa.

● The Navy rapped our knuckles for including asterisks to indicate Navy-approved rods. Therefore, the chart is being reprinted without the asterisks. The price is 15c in stamps.—Ed.

NEGATIVE RAKE CUTTING

SIR:

PLEASE SEND LATEST AMERICAN KNOWLEDGE AND PRACTICE ON NEGATIVE RAKE MACHINE CUTTING TOOLS.

ROVER COMPANY
New Meter Works,
Helen St.,
Coventry, England

● The first reference in The Iron Age to negative rake cutting tools was in the article by Gaylord G. Thompson, "Carbide Tools for Shell Work," May 14, 1942. The next was "Using Carbides on Large Machines," by Fred W. Lucht, of Carboloy Co., June 11, 1942, issue. The next was a March 25, 1943, article, "New Slants on Carbide Tools," by Gaylord G. Thompson. Our most extensive article on the subject was "High Speed Milling in Aircraft Production" in the Oct. 14, 1943, issue. For a comprehensive report of the ASME meeting on high speed milling see the Dec. 9, 1943, issue.—Ed.

SIR:

RE YOUR MENTION IN MAR. 16 ASSEMBLY LINE, PAGE 78, OF A MACHINE THAT SHAPES ALL GEAR TEETH SIMULTANEOUSLY. IS MACHINE AVAILABLE FOR SALE?

EAGLE PRECISION TOOL & DIE CO.
Long Island City, N. Y.

● The machine is now being tested in actual production. Until testing has been completed the developing company wishes its name and details of the machine withheld.—Ed.

BUTTON PRESSER

Sir:

"Profit Not Without Honor," your Mar. 16 editorial, is very much on the button. We would like 1,000 reprints.

HENRY BOOTH,
Vice-President
Shawinigan Products Corp.,
Empire State Building,
350 Fifth Ave.,
New York 1

● Owing to paper rationing, we are unable to supply the reprints, but you have our permission to reproduce it. We suggest photo-offset.—Ed.

PLASTER MOLDS

Sir:

Will you be good enough to give us the names and addresses of manufacturers of plaster for use as molds for non-ferrous castings?

E. ST. J. BARE,
Office Manager
Precision Dies & Castings, Ltd.,
156 St. Helen Ave.,
Toronto 4, Can.

● Certain-teed Products Corp., 120 So. LaSalle St., Chicago 3; National Gypsum Co., Burley Bldg., Delaware Ave., Buffalo, N. Y., and United States Gypsum Co., 300 West Adams Street, Chicago.—Ed.

TOOL FORECASTING

Sir:

Could you send us some clippings of the article, "Forecasting Tool and Gage Requirements" in your Mar. 9 and 16 issues?

DOROTHY PENTECOST,
Secretary to President
Sheffield Corp.,
Dayton, Ohio

"HOW DOES MUEHLHAUSEN MAKE THOSE SUPER-SIZE SPRINGS?"

Well—it's this way. Those big babies must be coiled hot, to extremely close tolerances...and produced in quantity at P-38 speed. It's specialized work that demands very specialized equipment. So—Muehlhausen has one huge plant totally devoted to hot forming. It is all conveyorized. Production is governed by a central laboratory. The quenching tanks are the size of swimming pools, and skyscraper-like shot blasters give springs clean, lustrous finish and added life.

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MUEHLHAUSEN SPRING CORPORATION
Division of Standard Steel Spring Company
817 Michigan Avenue, Logansport, Indiana

This Industrial Week . . .

- **Tightness in Semi-Finished Steel Reported Becoming More Intense**
- **Shell Steel Orders, Packing Needs, Lend-Lease Demands Higher**
- **Sporadic Strikes Continuing to Delay War Production**

REFLECTING the extra heavy demand for steel sheets, plates, and strip, as well as other requirements which are stronger for war and lend-lease consumption, new tightness is appearing in billets, sheet bars, and allied semi-finished material.

Four months ago ingots were piling up and semi-finished was easier. Contracts which were over the price ceiling for ingots were being cancelled. A number of open hearths eventually became idle and some high cost production facilities were closed. Today requirements for some types of shell steel are on the increase again, large orders for sheets for shell packaging are pending, and lend-lease needs are heavier for semi-finished items differing from those in biggest demand by this agency last fall.

The old bottleneck, lack of enough blooming mill capacity, is being felt keenly again. So-called distress stocks of material long piled are being culled over. Premium mills may find themselves more active, although perhaps not on the same price basis which formerly prevailed.

It seems to be established, at least as far as opinion is concerned, that the plate load will be lightened in third quarter, but that this space on mills will be immediately taken up for sheets. Unusually high tonnage figures continue to be circulated on the additional possible use of heavy gage hot rolled sheets for shell containers and other packaging. Large orders already have been booked for this purpose. Tin plate, pipe, and bessemer steels are quite active. The carbon bar market is lively, with deliveries at one Chicago mill recently jumping from June until August in certain sizes in the space of a single day. Strength also is apparent in alloy departments where substantial further business is expected for Army and Navy rocket requirements.

The lengthy deliberations between OPA and the steel industry over carbon steel price advances have resulted in many shifts as to the probable outcome. What appears likely one week in the way of advances does not always seem so sure a week later. Latest unofficial dope is that rails, plates, bars, and hot rolled sheets may be up $3 to $4 per ton, and that perhaps an advance on structural steel will be permitted. Reductions may be made in armor plate and some miscellaneous items. These tentative decisions are subject to change.

MEANWHILE, labor developments have been coming forward at a fast rate. By a vote of 7 to 2, the U. S. Supreme Court upheld portal-to-portal pay for underground ore miners in the South, a decision which some observers believe will have widespread implications. In the steel wage proceedings at Washington it seemed clear to certain close followers of the case that steel workers would be given a raise, thus opening the way to wage demands by workers in allied industries.

Over the nation, sporadic strikes were continuing to delay war production. The number of short walkouts in the steel industry in some areas appears to have been on the increase. A stoppage at a Duquesne plant near Pittsburgh cost about 5400 tons of steel, and other disputes in the same district included a strike of coal mine motormen at a steel company mine in California, Pa., and a walkout by maintenance workers at the Clairton by-product works. Another flash strike hit the American Works of American Steel & Wire Co. at Cleveland.

The Mechanics Educational Society of America, which caused a walkout in February of about 25,000 skilled tool and die workers in the Cleveland, Detroit,

Rail Steel Mills' Output Climbs

Washington

• • • Production of rerolled rail steel has been increased more than 80 per cent as a result of a carefully planned program begun early in 1943, John T. Whiting, director of the WPB Steel Division, said on March 25. Twenty-two rail steel mills in the nation produce steel bars and small shapes by rerolling used railroad rails. Five are operated by large companies with integrated steel plants—the remainder by small firms. Late in 1942 many were at the point of closing for lack of business.

"Various new or amended regulations were issued to permit the use of rerolled rail steel where other steel was prohibited, as, for example, for such important products as farm fence posts and military steel cots," said Mr. Whiting. "In addition, steps were taken to promote a greater use of rail steel for concrete reinforcing bars, Army entanglement posts, farm implements, small tools, etc.

"This program resulted in a steady increase in the output of rail steel mills. Shipments in January, 1944, totaled 43,019 tons as compared with 23,716 tons in January, 1943."

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and Chicago areas in a jurisdictional dispute, won the recent NLRB election for bargaining rights at the Willys-Overland plant in Toledo, original seat of the dispute.

Donald M. Nelson has declared himself in favor of using 4-F's and men over 38 in essential industries in the form of a Limited Service Act.

IN announcing last week that railroads received 1,538,984 gross tons of rails in 1943, compared with 1,260,000 tons allocated in 1942, ODT officials in the rail group expressed the opinion that the carriers will need the 2,000,000 tons that ODT has requested of WPB for 1944 if they are to keep their roadbeds in shape. At the same time it was stated that the railroads may experience difficulty in the laying of the rails that are made available during the coming months. The statement did not say so but it is assumed that the difficulty in laying rails to which reference is made is due to shortage of some 45,000 maintenance of way workers.

The 1921-1929 yearly average of new rails placed in track was 1,855,432 tons, while the 1930-1938 average was 784,943 tons.

A rocky future is being predicted for the new Surplus War Property Administration, now about one month old. Legal pitfalls (there are 150 statutes in the disposal of real estate alone) and questions of divided authority may be hurdles for SWPA, it is said. There is considerable proposed legislation on Capitol Hill which would wipe out the new agency and set up a group to dispose of surpluses, responsible to Congress and not the Executive. Will Clayton, the administrator of SWPA, is not sure whether he has authority over all contract terminations. He appealed to a House committee last week not to give surplus disposal authority to the RFC until SWPA has had at least two months' trial.

PLANS of the Foreign Economic Administration to permit commercial channels to ship steel to the Middle East countries are being watched with interest, despite the fact quantities presumably will be small for the time being. Shipments will consist of tonnage that for one reason or another is no longer of military use. The action reflects a trend that is developing in both the United States and England.

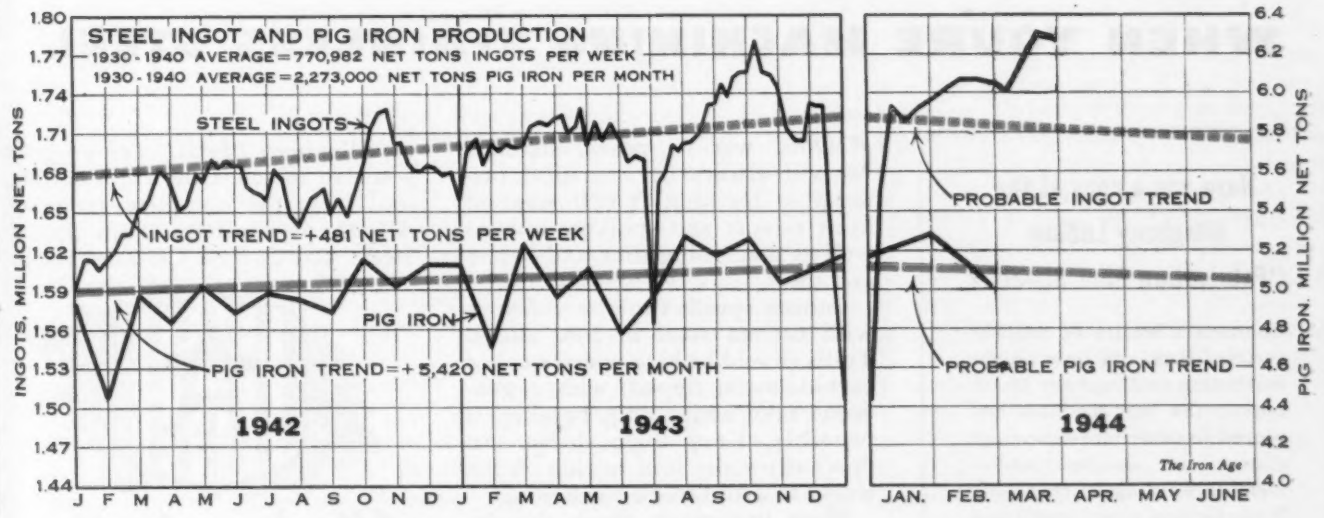
Basic rules governing the use of preference ratings have been revised to bring them up to date and make certain operating changes, WPB has announced. In the future, all defense orders will be rated at least AA-5. Malleable iron casting inventories have been limited to a 45-day supply, under M-21-i, and acceptance of delivery of such castings is prohibited if the delivery increases the purchaser's stocks to more than a 45-day supply.

Civilian Programs May Be Slashed

Washington

• • • Replying to reports from WPB that the Army was further hindering civilian production and that third-quarter civilian programs would be cut back to the level of the first quarter, a high Army Service Forces official told THE IRON AGE on Tuesday that this might be done. However, he pointed out that it would not necessarily be the first-quarter level, but that the Army was urging a level to be established for each quarter. Within that level the responsible civilian agencies would work out their programs and no special programs would be instituted to plague the Army.

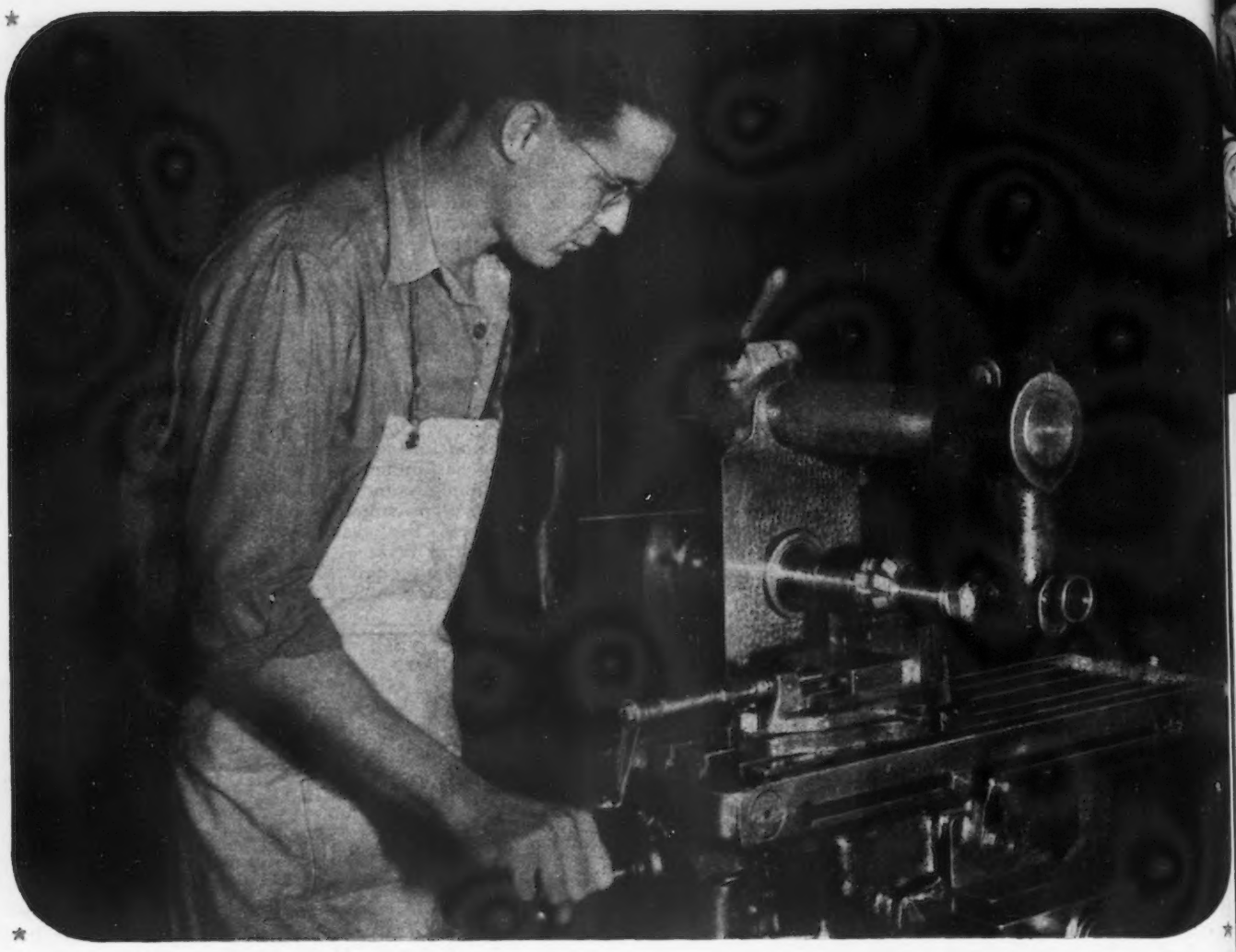
A plan of this sort would relieve the Army from deciding what civilian products are to be made and in what quantity. For after the level was established Army responsibility would cease. The official said that the Army has difficulty enough working out its own production plans and should not be constantly beset by civilian plans which would further complicate the Army's work. For example he said that, despite the current easing in steel, the Army finds that certain types of steel plate will be extremely short for at least another quarter.



Steel Ingot Production by Districts and Per Cent of Capacity

Week of	Pittsburgh	Chicago	Youngstown	Philadelphia	Cleveland	Buffalo	Wheeling	South	Detroit	West	Ohio River	St. Louis	East	Aggregate
March 23	95.5	101.0	98.0	91.5	99.5	102.5*	97.0	99.0	101.0	90.5	81.0	96.0	90.5	97.0
March 30	95.5	101.0	97.5	90.5	102.5	104.5	97.0	99.0	101.5	87.5	88.0	86.0	90.5	97.0

* Revision



Check these Main Points

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ADDRESS DEPT. IA-23

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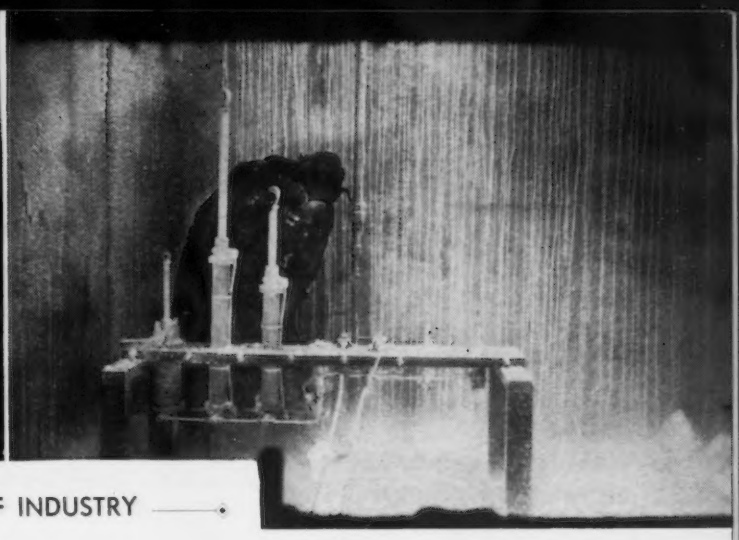


MEN BEHIND MASKS: *Buck Rogers cartoon characters are commonplace now in industry. At left, steel propeller shafts are sprayed with Thiokol synthetic rubber, a Schori Process Corp. photo. At right, hydraulic units are tested in cold room at Glenn L. Martin Co.*

Ground Work for New Wage Policy Believed Laid by CIO and Administration in Steel Case

By DONALD BROWNE
Washington Staff

Washington

• • • **On their way** toward establishing a new "stabilization" program, the CIO and the administration last week laid the ground work for a new national wage policy when WLB permitted the steel panel to receive "evidence" from USWA tending to show that the "Little Steel" formula should be buried and steel workers' wages should be raised, once more.

The open partnership between the President and CIO was never more evident. USWA President Philip Murray tossed a bomb of criticism at Congress for its failure to accede to the Treasury's tax program, including, its repeal of the CIO-sponsored $25,000 salary limitation. The criticism was no sharper than the President's tax bill veto message.

The day before, WLB Chairman William H. Davis told the Senate Banking and Currency Committee: "If the present wage stabilization policy (the 'Little Steel' formula) is doing gross injustice, I want to find out. We created the 'Little Steel' formula to avoid gross inequities. If it is creating gross inequities and injustices I will say so to the President, or to Congress."

Mr. Davis also said that if Congress forbade subsidies that WLB would be forced to recommend modification of the "Little Steel" formula. An amendment to the price act which is up for extension before the committee would abolish subsidies.

Consequently, it is clear to observers that the government is going to give the steelworkers a raise, and open up a way for general wage increases to workers in allied industries. It is doubtful, however, that the board will grant the entire 17c. per hour demanded by the union, but if the steel companies would agree to 17c. increase rumor has it that CIO would abandon the remainder of its demands.

Senators regarded the testimony of Mr. Davis as an invitation to Congress to establish a new wage policy of its own, and many observers believe that the administration would welcome Congressional intervention as a method of pulling its own chestnuts out of the fire.

Senator Robert Taft, Ohio Republican, told THE IRON AGE that he did not believe that the Senate would be disposed to act in the matter, that the sentiment of the Senate is to permit the administration to "stew in its own juices."

Afer Mr. Taft had closely questioned Mr. Davis about the exception to the "Little Steel" formula granted by WLB, he declared that to him the formula seemed like "hash." He told THE IRON AGE that if the committee were to recommend legislation it would tie wages to the cost of living and then absolutely make it an inflexible rule that there could be no exceptions.

Mr. Taft indicated that in its present form the "Little Steel" formula is unworkable and that the exceptions of the railroads and the coal mines have eaten away the rule. He said that 25 per cent would be more workable percentage than the 15 per cent under the little wage formula.

Although WLB may recommend to the President that the "Little Steel" formula be abandoned, other demands of the union are more doubtful in the opinion of observers. Issues, it is believed, the union cannot hope to win are: dismissal wages; abolition of geographical wage differentials; its "rehabilitation" slush fund; free life, disability, and hospitalization insurance; and the guaranteed annual wage.

What would happen to the demands for continuance of union maintenance and the check-off if the war should terminate in Europe before the case is decided is problematical. The consensus is that the steel companies would feel more like making a court test of these issues if the war were over. There is little doubt of the outcome, if the Supreme Court follows the settled law, once the case reaches it. Steel executives here say that the result of the court's ruling these issues unconstitutional would be strikes, and this is why no test has been made yet.

Claiming that the national income is being distributed unfairly because labor has received less proportionately during 1943 than in 1939, the union is pinkly asking the government to redistribute the national income because wage earners have borne the burden of inflation caused by excessive corporate profits.

The union insists that further wage increases will not cause inflation and past increases have had no part in heightened costs of living since July, 1942, but the union's illogical argument on this point was defeated by its

own introduction of evidence showing percentages received by labor, farmers, and corporations.

According to CIO, in 1943, corporate profits after taxes were about $9,141,000,000 or more than 175 per cent higher than the 1936-1939 average $3,324,000,000. Mr. Murray also said that the average salary increase of steel executives in 19 companies was 36.2 per cent in 1942 over the 1936-39 average.

This argument was typical. It ignores the fact that national income in 1943 was more than double that in 1939, that labor's share of national income practically doubled in 1943 despite a diminution in the total number gainfully employed and that steel wages have risen at least 31 per cent in the same period.

Industry spokesmen here indicate that the steel industry would rather close down in peacetime than to grant the guaranteed annual wage to the union. This request is seen as a union attempt to do in wartime what could never be accomplished in peace, and to gain under the cloak of the President's assumed war powers what the government has never had the power to order.

The union has pointed out that the steel industry can afford to pay for its demands because it is in the strongest financial position of its history. Yet the American Iron and Steel Institute figures show as of June, 1942, that steel prices had only advanced 1 per cent since 1939, while the general price level was above 30 per cent.

Way Is Opened for Steel Exporters To Trade With Middle East Nations

Washington

• • • **Reflecting** a trend that is developing in both the United States and England, the Foreign Economic Administration last Thursday announced plans for the increased use of commercial channels for the shipment of iron and steel products to the Middle East countries. Similar plans previously were instituted with respect to textiles and drugs and were made possible by Allied Control of the Mediterranean Sea. The move represents a shift from group buying by lend-lease to purchases by private interests.

While the plan calls for continued licensing of shipments, it eventually will establish direct negotiations between importers and American exporters and make unnecessary dealing with the present Middle East Center, the Anglo-American agency established in Cairo for the screening of commercial orders for the Middle East. Exporters and manufacturers interested in the new plan were requested to communicate with the Combined Agency for Middle East Supplies, 837 Seventeenth Street, N. W., Washington, which has charge of licensing. The countries to which commercial shipments of steel may be made are Egypt, the Anglo-Egyptian Sudan, Iran, Iraq, Syria, the Lebanon, French Somaliland, Ethiopia, Eritrea, Saudi Arabia and Cyrenaica.

American exporters will be required to send the combined agency data, about the types of steel products they are in a position to supply. Exporters should give full details and indicate minimum quantities of each product acceptable on each order. Houses having agents in the Middle East should furnish their names and addresses.

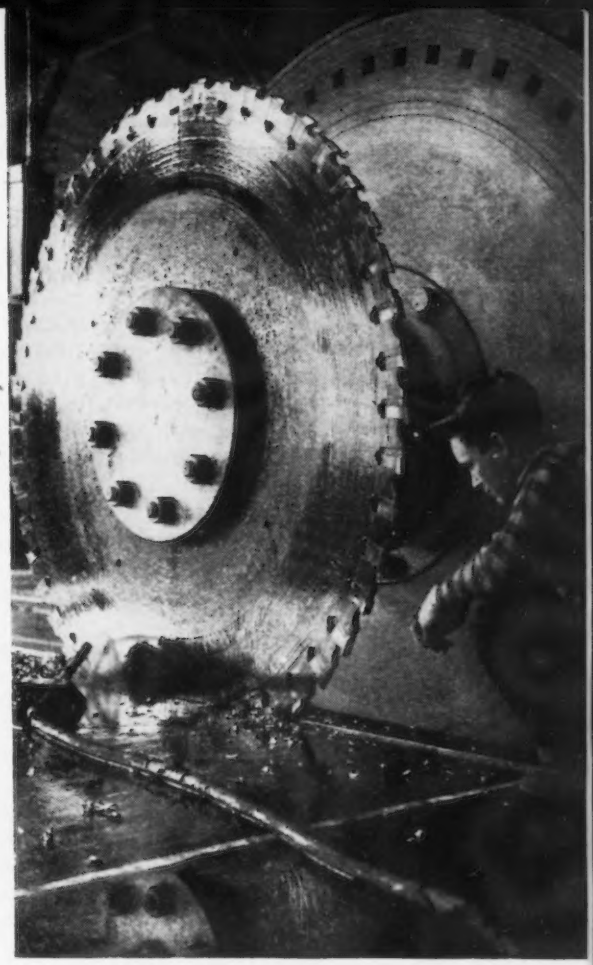
In order not to build up hopes of a large trade for the present, FEA said that the quantities which can be licensed will be small for the time being.

While war demands will make it impossible to sell critical steel tonnages commercially, the list of products that may be shipped to the Middle East includes plates, sheets, pipe and tubes which definitely are within that category. Other products listed are bars, beams, channels, angles, nails, screws, bolts and nuts. It was pointed out, however, that shipments will consist of tonnage that for one reason or other is no longer of military use. The WPB Steel Division reported 1,800,000 tons of such steel on Oct. 1, 1943, and the quantity in the meantime has changed but little. While this steel may be bought, use of much of it is prevented by L and M orders.

All the steel that may be exported to the Middle East is subject to WPB release. FEA acts as the claimant agency for the exporters.

TORPEDO CATCHERS: ***Anti-torpedo nets, vital in the campaign against these shipping threats, require highly-specialized care in construction and maintenance. Constructed of heavy steel and designed to absorb the force of a discharged torpedo, the nets are placed at harbor mouths and around anchored ships. On the left, the broken net is elevated for replacement, while the photo to the right shows the new section being towed into the water.***

Relationship of Alloy Steel to Total Output Due for Stabilization



● *Trimming armor plate at South Charleston Naval Ordnance plant, Carnegie-Illinois Steel Corp.*

Pittsburgh

● ● ● **Just as** significant as the 310 per cent increase in the production of alloy steel in 1943, compared with 1939, was the tremendous expansion in open hearth alloy steel during that period, despite the substantial increase in electric steel capacity.

While electric steel capacity was increasing from 1,725,000 tons in 1939 to 5,351,000 tons on Jan. 1, 1944, the open hearths of the country, which in 1939 were making 77 per cent of the total alloy steel, still, in 1943, accounted for an average of 70 per cent of the total alloy steel produced. The speedy increase in electric steel capacity during 1943, however, coupled with a slight falling-off in alloy requirements, caused the WPB last year to force a transfer of alloy steel orders from the open hearths to the electric furnace. Subsequently, this order was revoked.

While statistics show that the average production of alloy steel from the open hearths in 1942 was 71 per cent, with electrics making 29 per cent, a monthly breakdown shows that in January, 1942, open hearths accounted for 67 per cent of the total. Their participation started a steady increase in March of 1942, and by December of that year open hearth alloy output was 74 per cent of the total. This gain in participation was made in spite of a substantial step-up in electric steel capacity. During that year, the WPB pleaded with the open hearths to produce more and more alloy steel, because the electric steel expansion program was behind schedule.

In 1943, although the yearly figures show that the open hearths accounted for 70 per cent of the total alloy steel, a monthly analysis for that year shows almost an identical reversal of what occurred in 1942. In January, 1943, the open hearths accounted for 75 per cent of total alloy steel output. During the second quarter of that year, when the WPB put the heat on for a greater alloy steel output in electric steel furnaces, the percentage made in the open hearths began to decline steadily; and in December of last year, the open hearths accounted for about 61 per cent of total alloy steel output. Part of this decline, however, apparently was attributed to a falling off in total alloy steel demand and greater pressure on the open hearths, for ordinary carbon steel.

With a "free market" now existent in alloy steel production, whereby if specifications are met the customer may order either open hearth or electric steel, the participation of the open hearths may tend slightly upward, from the trend which existed in the last quarter of 1943. In January of this year, the open hearths produced 64 per cent of the total alloy steel produced, compared with 61 per cent last December, 63 per cent last November, and 65 per cent last October.

While there is a tendency for some increase in total alloy steel requirements, it seems to be apparent that the high point in output reached in March, 1943, when monthly production was 1,283,000 tons, will not be

Alloy Steel Production vs. Total Steel Output
1939-1943
Net Tons. 000 Omitted.

YEAR	Alloy Steel Production	Alloy Steel Per Cent of Total Steel	Total Steel Production
1939	3,212	6.1	52,799
1940	4,966	6.3	66,983
1941	8,206	9.9	82,839
1942	11,526	13.4	86,032
1943	13,116	14.8	88,873

Trends in Alloy Steel Production
Open Hearth vs. Electric
1939-1943
Source—American Iron & Steel Institute. Compilation—The Iron Age
Net Tons. 000 Omitted.

YEAR	ALLOY STEEL OUTPUT				
	O. H.		Electric		
	Production	Per Cent of Total	Production	Per Cent of Total	Total Production
1939	2462	77	750	23	3,212
1940	3679	74	1287	26	4,966
1941	5743	70	2463	30	8,206
1942	8133	71	3393	29	11,526
1943	9221	70	3895	30	13,116

matched soon again. This situation is already reflected in the number of idle electric furnaces throughout the country, including not only the ones which the WPB shut down, but private furnaces as well.

There are some in the industry who believe that in the postwar period alloy steel output, compared with total steel production, will not be able to maintain the wartime position it has held. There are probably as many others who believe that the percentage of alloy steel output, to total steel production, will be somewhat ahead of the peactime experience, and not too far below the 1942-43 relationship. In 1939, alloy steel represented about 6 per cent of total steel production. It climbed to about 10 per cent in 1941, was 13.4 per cent in 1942 and reached 14.8 per cent in 1943.

As alloy output declines, due to a contraction in total demand, while total steel output continues to reach new peaks, it is obvious that the per cent of alloy to total steel will be reduced. There is no evidence now, however, that this percentage will decline so rapidly that it will approximate a peacetime magnitude. An indication of which way the wind may be blowing are statistics for January of this year, which showed that total alloy production was slightly more than 12 per cent of total steel production (see below). This does not mean, however, that alloy is in for a consistent drop, with relationship to total steel production. A change in product mix later in the year, coupled with a falling-off in plate demand, may result in a fairly stabilized relationship between alloy steel and total steel production, which may come somewhere between the 1941 and the 1942 average participation.

•

• • • **Production of** alloy steels during February totaled 905,131 tons, about 13 per cent of total steel production during that month, according to the American Iron and Steel Institute.

In January, 919,017 tons of alloy steel were produced. In February a year ago alloy steel production amounted to 1,168,592 tons, or 17 per cent of total steel output.

Open hearth furnaces produced 584,167 tons of alloy steel in February. The remaining 320,964 tons of alloy steel production came from electric furnaces.

Steel Producers Report Net Earnings

• • • **Republic Steel Corp.'s** annual pamphlet report pointed out that cost of construction for the account of the DPC has amounted to more than $160,000,000. It was said most of the items represented capacity not required for Republic's normal peacetime business.

While there will be no problem of reconversion in the steel making units for Republic, it is pointed out that the manufacturing plants present a very different problem. Reconversion of these units is one of the company's major problems.

A new peak of business was reached in 1943 both as regards steel produced and dollar value. Gross sales were $552,329,734, compared to $521,110,835 in 1942. Net income for 1943, however, was $12,011,057, compared to $17,154,578 in 1942.

National Steel Corp. reported net earnings of $11,698,362 for 1943, as compared with $11,929,867 in 1942. Sales in 1943 amounted to $256,168,340, the highest in the history of the company, and an increase of 16 per cent over 1942. As pointed out by many other steel producers, income was lower while sales were higher during the past year, for the reason that higher costs of production have not been compensated by increases in selling prices, which have been maintained on the basis established by OPA in 1941.

Inland Steel Co., in its statement, reported a net income of $10,801,564 as compared with $10,721,372 in 1942. Operations during the year were at 106.6 per cent of capacity, yielding 2,785,734 tons of finished and semi-finished steel for shipment.

During 1943, Inland spent $4,463,300 for new construction and improvements. This is about 50 per cent of 1942 expenditures which totaled $8,700,000.

Pittsburgh Steel Co., showed a net profit for 1943 of $1,734,222, as compared with $2,488,074 in 1942. The report stated that the company installed cold drawing facilities for the manufacture of certain types of seamless tube at its Allenport plant, as agent for DPC. This addition was completed early in 1943 and is now being used on a rental basis. In November, 1943, an appropriation of $1,700,000 was authorized for the construction of a new automatic tube mill at the Allenport plant to replace the present No. 3 mill. The mill will have a range of sizes and an efficiency of operation that will result in a substantial improvement in the company's ability to serve the postwar demand for oil country pipe.

Rustless Iron & Steel Corp. largest single producer of stainless steel, had no changes in productive capacity during 1943. Net sales for 1943 were $32,996,894, as against $32,116,889 during 1942. Earnings, however, were down slightly, amounting to $2,236,492 in 1943 as against $2,644,557 in 1942. At present, the company, in close cooperation with the American Rolling Mill Co., is doing considerable research relating to armor welding with stainless steel electrodes. This and another similar project is being carried on under the auspices of the National Research Council and the Navy Department.

Granite City Steel Co., reported net sales of $17,225,000 during 1943, about 3 per cent under those for 1942. This drop was blamed on an increased proportion of lower priced products. As the company is operating under directive of WPB, it had no control over the varying proportions of products made. Profits for 1943 amounted to $554,000. Granite City's new DPC open hearth plant began operations in November, and the remainder of that expansion program has been completed during the past few weeks.

NMTA DISTRICT PRESIDENT: *Arthur T. Clarage, re-elected president of the Chicago branch of the National Metal Trades Association, cited the Chicago area on its production-management achievement as based on Ordnance Department production figures.*

Canadian War Output Reported At Daily Rate of $8,000,000

Ottawa

• • • **Canada's industrial** war production during 1944 will total $2,850,000,000 or just about $8,000,000 a day, Hon. C. D. Howe revealed in the House of Commons. This is an increase of about $83,250,000 over last year's war output. By the end of this year Canada will have made in its factories and shipyards, $8,750,000,000 of war supplies for the Dominion and its allies. This includes miscellaneous military stores, mechanical transport, cargo and naval vessels, aircraft, armored vehicles, guns and small arms, gun ammunition, instruments and signals, chemicals and explosives and small arms ammunition.

As long as war demand for motor vehicles continues at its present level, there is no prospect of resuming manufacture of passenger autos, Mr. Howe asserted. But more trucks will be made during 1944 and will, to a greater extent, be available for essential business this year than last. Control of truck distribution will be maintained.

The steel situation, the minister said, has improved materially in recent months. Seven steel control orders have been lifted and more steel is being made available to civilian industry. But sheet steel, used in manufacture of many household and other equipment, is still in short supply.

War demand for construction materials has fallen off and much freer building of private dwellings is being permitted. But the position has not sufficiently improved yet to generally permit building of public buildings, churches, or places of amusement.

Following are production highlights in C. D. Howe's report to the House of Commons:

Aircraft: 4133 were produced in 1943; 2811 in 1942, a total production at March 1 of 11,390. Expansion of program will continue, with a change from trainer to combat aircraft.

Armored Fighting Vehicles: 15,500 produced in 1943, 12,500 in 1942, a total at March 1 of 34,000 units. Production of self-propelled mounts and other armored fighting vehicles will continue at a high rate in 1944.

Mechanical Transport: Production dropped from 192,000 units in 1942 to 175,000 in 1943 because heavier and more costly equipment was made in 1943. March 1 total is 593,000 units. Fewer units of heavier types will be produced in 1944.

Locomotives: 24 are being produced monthly for shipment overseas.

Artillery Gun Barrels, Carriages: 1943 total was 45,000; 1942 total was 31,000; total production to date is 84,000 units. There will be a cut in army gun production, a slight increase in production of naval guns.

Machine Guns, Rifles, Other Small Arms: 325,000 in 1942, 580,000 in 1943, total production, 1,000,000 units; 1944 production will be slightly greater than in 1943.

Gun Ammunition: 30,000,000 rounds produced in 1943, and 28,000,000 in 1942. Total production since beginning of this war, 62,000,000 rounds. Production rate in 1944 will be about the same as in 1943.

Small Arms Ammunition: 1,200,000,000 rounds in 1942, 1,500,000,000 rounds in 1943, total production to date is 3,500,000,000 rounds. Program will be reduced in 1944.

Chemicals and Explosives: 1,000,000,000 lb. in 1943; 860,000,000 lb. in 1942; total production at March 1 was 2,300,000,000 lb. Program will be reduced, one major explosive plant already closed.

Cargo Vessels: 150 vessels, or 1,476,000 deadweight tons, in 1943; 81 vessels, or 838,000 deadweight tons, in 1942. Total production at March 1, 249 vessels. Slight reduction of program in 1944.

Naval Vessels: 100 produced in 1943; 117 in 1942. Since war began, 336 escort vessels produced. Actual deliveries of escort vessels and other new types will be higher in 1944.

Small Craft: 3600 delivered out of total of 4300 orders placed. Rate of deliveries in 1944 will be about the same as in 1943.

Instruments and Communications Equipment: $180,000,000 worth produced in 1943; $84,000,000 worth in 1942; total value since the war began, $320,000,000. Program will continue to expand.

Lake Boats Being Loaded

• • • **With a possible** early opening of Great Lakes shipping in view this year, some pre-season permits are being issued covering railroad movements of certain grades of coal to lower lake ports. The first boats for upper lake docks are expected to clear lower ports in late March.

Railroads Hammer Anew Against Land Grant Rates Favoring Government

Pittsburgh

• • • **E. G. Plowman,** vice president in charge of traffic for U. S. Steel Corp. of Delaware, outlined recently before the Pittsburgh Chapter of the ICC Practitioners the turn that legislative provisions for land grant railroads has taken in recent years. The land grant rate reductions, he said, have been used to cut government freight costs for many purposes, even though these reductions were limited by Congress on Sept. 18, 1940, to purely military traffic.

While this modification might be expected to have solved the problem, in effect it didn't because land grant rates are still legislated rate adjustments, he said.

Estimates of the effect of land grant deductions are as follows: Federal traffic in the fiscal year 1943-1944 is expected to pay the vast freight bill of $1,500,000,000 after taking advantage of about $200,000,000 of land grant deductions. As an example of land grant deductions, here are rates he cited on iron and steel moving to Tacoma, Wash., from 10 eastern basing points:

From	Commercial Rate, $ per 100 Lb.	Land Grant Rate, $ per 100 Lb.
Coatesville, Pa.	1.43	0.91
Claymont, Del.	1.43	0.90
Sparrows Point, Md.	1.43	0.89
Harrisburg, Pa.	1.43	0.88
Johnstown, Pa.	1.2925	0.77
Youngstown	1.27	0.73
Cleveland	1.27	0.72
Pittsburgh	1.27	0.72
Granite City, Ill.	1.05	0.57
Chicago	1.10	0.56

Deductions from commercial rates are not confined to railroads given the original land grants. To meet competition, other roads have filed with the government an agreement to equalize any deductions that would apply over the competitive land grant road.

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Chicago

• • • **Ability of the** nation's railroads to purchase large amounts of new equipment in the postwar period will be threatened by federal refund claims of $300,000,000 to $500,000,000 for land grant rate rebates on war traffic, William M. Jeffers, president of the Union Pacific, said here March 20. He termed land grant rates the most serious problem facing the roads, and told of reports that the federal general accounting office, which figures land grant claims, already had chalked up $175,000,000 in refunds that would be asked.

The general accounting office, now said to be close to three years behind in this work, will present the claims in several years, when the carriers will be least able to meet them, Mr. Jeffers feared.

Much war time freight is in a twilight zone, so far as the lower land grant rates are concerned, he said. The general accounting office may decide that certain freight moved at regular rates should have been billed on a land grant basis, he declared.

The transportation committee of the Chicago Association of Commerce has filed a statement with the Congressional sub-committee now hearing arguments on the Boren bill favoring repeal of the land grant rates. The view is emphasized that serious discriminations have been caused between manufacturers, who encounter difficulty in determining accurately transportation charges to be assessed on traffic moving under land grant rates.

Portal-to-Portal Pay Approved By U. S. Supreme Court Decision

Washington

• • • By a vote of 7 to 2, the United States Supreme Court in a decision on March 27 held that the Fair Labor Standards Act requires portal-to-portal pay for underground iron ore miners. The case involved demands of CIO ore miners in 12 Jackson County, Ala., underground mines of the Tennessee Coal, Iron & Railroad Co., the Sloss-Sheffield Steel & Iron Co. and the Republic Steel Corp. The majority opinion upheld previous findings of the District Court and the Fifth Circuit Court of Appeals. Steel companies maintained that work time was the time given to the actual mining of ore.

Justice Murphy said that the issue can be resolved "only by discarding formalities and adopting a realistic attitude, recognizing that we are dealing with human beings and with a statute that is intended to secure to them the fruits of their toil and exertion." The travel to and from the mines was held to be part of the work time. Concurring reports were written by Justices Frankfurter and Jackson.

Justice Roberts in a dissenting decision in which he was joined by Chief Justice Stone, took an entirely contrary view. Justice Roberts said that the case should not be "decided on the basis of any broad humanitarian prepossessions . . . not with a desire to construe legislation so as to accomplish what we deem worthy objects but in the traditional and . . . essential attitude of ascertaining what Congress has enacted rather than what we wish it had enacted."

Justice Roberts added that Congress meant by the work-week the period of actual service rendered to the employer for which he pays wages in conformity with custom and agreement.

"In determining whether this underground travel constitutes compensable work or employment within the meaning of the Fair Labor Standards Act, we are not guided by any precise statutory definition of work or employment," the majority report said. "Section 7 (a) merely provides that no one, who is engaged in commerce or in the production of goods for commerce, shall be employed for a work-week longer than the prescribed hours unless compensation is paid for the excess hours at a rate not less than one and one-half times the regular rate."

Justice Murphy said that viewing the facts as found by both courts below: "We are unwilling to conclude that the underground travel in petitioners' ore mines cannot be construed as work or employment within the meaning of the Act." The decision said that the exacting and dangerous conditions in the mines shaft "stand as mute, unanswerable proof that the journey from and to the portal involves continuous physical and mental exertion as well as hazards to life and limb." This compulsory travel, it was stated, occurs entirely on the petioners' property and is at all times under their strict control and supervision. It was maintained that the travel time is spent for the benefit of the owners of the mines and their iron ore mining operations. It was declared that iron ore miners traveling underground are engaged in a "process of occupation" necessary to actual production.

Justice Murphy said that it is immaterial that there may have been a prior custom or contract not to consider certain work within the compass of the work week or not to compensate employees for certain portions of their work. The Fair Labor Standards Act, it was asserted, was not designed to codify or perpetuate those customs and contracts which allow an employer to claim all of an employee's time while compensating him for only a part of it. Congress intended, instead, the decision said, to achieve a uniform national policy of guaranteeing compensation for all work or employment engaged in by employees covered by the act.

It was pointed out, however, that the decision does not foreclose reasonable provisions of contract or custom governing the computation of work hours where precisely accurate computation is difficult or impossible. Nor, it was stated, is the Court concerned with the effect that custom and contract may have in borderline cases where certain activity or non-activity constitutes work or employment.

After proving that miners have never previously been paid for underground travel time, that the Fair Labor Standards Act never intended to require employers to pay for portal pay, and that all previous agreements provided against such pay, Justice Roberts concluded his dissent by quoting the dissenting opinion of the lower court as representing his view of the result of the majority decision.

Magnesium Fabricated Products Shipments Doubled in 1943

Source: WPB Aluminum-Magnesium Division Monthly Shipments, 1942-1943
(In thousands of pounds)

	Castings			Wrought Products		
	Sand	Permanent Mold[1]	Die	Forgings	Extrusions[2]	Sheet, Strip and Plate
1942—January	1,984	33	58	3	28	37
February	1,973	34	61	3	20	36
March	2,284	32	93	2	16	35
April	2,428	50	77	3	21	43
May	2,536	70	90	5	25	56
June	2,547	84	126	1	19	71
July	2,639	97	113	3	35	86
August	2,642	124	122	5	29	107
September	2,868	164	129	3	41	123
October	3,426	200	155	7	49	100
November	3,428	226	105	4	53	92
December	3,536	249	176	4	82	94
1942—Total	32,292	1,364	1,304	42	416	879
1943—January	3,934	253	189	10	62	145
February	3,931	299	215	10	62	139
March	4,802	300	262	16	85	132
April	4,694	284	259	17	67	129
May	4,652	343	268	29	84	164
June	4,159	296	235	9	77	112
July	4,406	290	244	12	64	101
August	4,770	257	211	9	96	93
September	5,391	390	227	25	85	162
October	6,096	431	247	27	114	129
November	6,068	452	272	28	121	151
December	6,220	382	238	34	113	222
1943—Total	59,123	3,978	2,866	227	1,029	1,680

[1] Excludes cast sticks, used for powder manufacture, and castings for incendiary bomb bodies.
[2] Excludes extruded sticks, used for powder manufacture, and extruded rolling slabs (sheet stock) and forging stock; includes rod and bar (other than forging stock), tubing, and shapes.

Procurement Division of Treasury Likely to Continue Playing Big Role

By EUGENE J. HARDY
Washington Staff

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• • • **The global** war in which the world now finds itself enmeshed has made Uncle Sam the largest buyer of military and non-military goods in history. The military needs are filled by direct purchase of the armed services, while practically all of the non-military items are contracted for by the little known Procurement Division of the Treasury Department.

The Procurement Division in its 10 years of operation has bought more than 900,000 different items, costing about $6,000,000,000. The magnitude of its purchases can be visualized by checking the amount of money the division poured out for lend-lease goods in about two years of buying, which adds up to more than $3,500,000,000.

During peacetime Treasury Procurement diverts huge sums of money into the coffers of American industry to maintain the normal operation of the government. In addition to the war buying it will continue to do for the duration, and buying for relief agencies which might continue for an indefinite period, Treasury Procurements offers a possible postwar market for companies who would like to sell to the government.

Although the termination of hostilities will undoubtedly slash the size of many government war agencies it seems to be a foregone conclusion that "big" government in peacetime is here to stay. Senator Taft, Republican of Ohio, an ardent opponent of New Deal spending, estimates that an annual federal budget of about $50,000,000,000 will be necessary in the immediate postwar years. The Senator thinks that about $5,000,000,000 of this amount would be used for public works, which is just one item that would require a government outlay of money for equipment.

There is a feeling that huge postwar surpluses will supply the government's needs for years to come, and thereby eliminate Uncle Sam as a customer. However, Treasury Procurement is bound by law to put surpluses to use as soon as the immediate needs of the government are established. Estimates of the total amount of surplus to be available run as high as $75,000,000,000 but preliminary studies indicate that not more than $15,000,000,000 worth will be usable in a normal peacetime civilian economy. If the letter of the Baruch-Hancock report is followed, not even all of this amount would be lying around to bedevil our postwar markets, since large quantities will have been disposed of by the end of the war and during the period of reconversion, as well as dumped on foreign shores.

The Procurement Division of the Treasury was set up in 1933 and culminated 150 years of effort to centralize control of government purchasing operations. The agency is required to buy any and all supplies commonly used by two or more government establishments, as well as be ready to embark on any special buying programs which might be necessary.

Under existing law peacetime purchasing and contractual operations require the division to advertise for bids, hold public bid openings and award contracts to the lowest responsible bidder meeting specification and delivery requirements. Under the strain of wartime a negotiated system of purchase, whereby the preceding requirements may be disregarded, has been instituted.

The Procurement Division is headed by Clifton E. Mack, who has been called the "world's largest civilian spender." Prior to taking over his present position in 1940 Mr. Mack served with the Bureau of Internal Revenue. He is 46 years of age and his New England background stamps him as a "Yankee Trader." He is a member of the faculty of American University and is considered one of the Nation's outstanding experts in the field of purchasing.

The sample room in the division's headquarters in Washington carries a multitude of items, which include the whole range of human endeavor. These items are samples of stock purchased by the government and include mainly goods used in normal times, since goods procured under emergency programs are too cumbersome and too urgently needed to maintain samples.

The first special buying program confronted the division in 1935 with the inception of the federal emergency relief program, which necessitated the buying of large quantities of heavy equipment, building materials and supplies. For the fiscal years 1936 to 1942, inclusive, the Procurement Division expended $1,424,000,000 on material of this sort.

PROCUREMENT CHIEF: *Clifton E. Mack is the Director of Procurement for the Treasury Department.*

In 1933 Treasury Procurement began the issuance of its "General Schedules of Supplies," which are the backbone of all purchasing work with industry. There are 103 different schedules, representing that many classes of goods. Some of these classifications are heavy machinery, hand tools, office equipment and textiles. To set up these schedules Procurement Division determines the needs of the government in a particular classification, then contracts with manufacturers to supply the required items, at a stated unit cost. These contracts run for a period of three, six, nine, or twelve months, during which time the contractor agrees to furnish the government whatever quantity of the item is needed at the stated unit price. Before the contract is signed the contractor is told how much of that particular item was bought by the government in the preceding year, so as not to place him in an unfair position, should the needs of the government be greater than his capacity.

From the contracts so obtained the general schedules of supplies are

(CONTINUED ON PAGE 106)

Government's Surplus Disposal Offices Over the Nation Listed

• • • The Chicago Association of Commerce has issued a 12-page bulletin (Special Bulletin No. 6) covering principal channels for disposing of government surplus property, with present procedures and a list of surplus disposal offices. The latter is published below.

Guide to Key Symbols

Goods sold are:
(NR) Non-reparable property
(SM) Surplus serviceable military and miscellaneous property
(SI) Serviceable industrial property

Sales arranged by:
(OB) Offerings and bids
(A) Auctions
(N) Direct negotiations
(L) Aid in locating industrial property

War Production Board Regional Offices

(War Production Board regional offices act as clearing houses to aid buyers in locating critical surplus war goods.)

REGION I
Facilities Department
Available Inventory Section
17 Court Street, Boston
Telephone: Lafayette 7500
Att: John W. Perry, Regional Mgr. (SI-L)

REGION II
Redistribution Division
Empire State Building, New York
Telephone: Murray Hill 3-6805
Att: A. G. Birkenmeier, Regional Mgr.
(SI-L)

REGION III
Redistribution Division
1617 Pennsylvania Blvd., Philadelphia
Telephone: Locust 3400
Att: R. D. Small, Regional Mgr.
(SI-L)

REGION IV
Redistribution Division
Candler Building, Atlanta
Telephone: Walnut 4121
Att: Elliott C. Newell, Regional Mgr.
(SI-L)

REGION V
Facilities Department
Union Commerce Building, Cleveland
Telephone: Cherry 7900
Att: R. J. Carroll, Regional Mgr.
(SI-L)

REGION VI
Production Service Division
226 West Jackson Boulevard, Chicago
Telephone: Andover 3600—Ext. 20
George A. Dinnen, Regional Manager
Att: John Brink (Materials) Ext. 14, 176, 422
Att: L. Nissen (Machinery & Equipment) Ext. 57, 58, 59
(SI-L)

REGION VII
Facilities Department
Mutual Interstate Building, Kansas City
Telephone: Harrison 6464—Ext. 134
Att: Harold W. Taft, Regional Mgr.
(SI-L)

REGION VIII
Redistribution Division
1131 Mercantile Building, Dallas 2, Tex.
Telephone: Riverside 5711—Ext. 616
Att: Ray L. Miller, Acting Regional Mgr.
(SI-L)

REGION IX
Redistribution Division
621 Continental Oil Building, Denver
Telephone: Taylor 3173
Att: Albert D. Neal, Regional Mgr.
(SI-L)

REGION X
Redistribution Division
1355 Market Street, San Francisco
Telephone: Klondike 2-2300
Att: W. D. Cloos, Regional Mgr.
(SI-L)

REGION XI
Redistribution Division
7310 Woodward Avenue, Detroit 2
Telephone: Trinity 2-4900
Att: R. F. Grindley, Regional Mgr.
(SI-L)

REGION XII
Redistribution Division
Midland Bank Building, Minneapolis
Telephone: Main 3244
Att: N. E. Kleckner, Regional Mgr.
(SI-L)

REGION XIII
Redistribution Division
White-Henry-Stuart Building Seattle
Att: Regional Manager
(SI-L)

Procurement Division, Treasury Department

U. S. Treasury Department
Regional Procurement Division
1630 Wazee Street, Denver
Telephone: Ke. 4151—Ext. 713
Att: Mr. Alden W. Pool
(SM-SI-OB)

U. S. Treasury Department
Regional Procurement Division
Faller Building, Cincinnati 14
(SM-SI-OB)

U. S. Treasury Department
Regional Procurement Division
2005 Fifth Avenue, Seattle
(SM-SI-OB)

U. S. Treasury Department
Federal Property Utilization Branch
603 Porter Building
Kansas City 2
(SM-SI-OB)

U. S. Treasury Department
Regional Procurement Division
Park Square Building, Boston
(SM-SI-OB)

U. S. Treasury Department
Procurement Division
Federal Property Utilization Division
76 Ninth Avenue, New York 11
Telephone: Ch. 3-8950
Att: F. W. Young, Chief
(SM-SI-OB)

U. S. Treasury Department
Regional Procurement Division
222 North Bank Drive, Chicago
Telephone: Delaware 8300
Att: Mr. Huber or Mr. Hershey
(SM-SI-OB)

U. S. Treasury Department
Regional Procurement Division
1229 20th Street, N.W., Washington, D. C.
(SM-SI-OB)

U. S. Treasury Department
Regional Procurement Division
10 Forsyth Street Building, Atlanta
(SM-SI-OB)

U. S. Treasury Department
Regional Procurement Division
609 Neil P. Anderson Bldg., Forth Worth, Tex.
(SM-SI-OB)

U. S. Treasury Department
Regional Procurement Division
335 Fell Street, San Francisco
(SM-SI-OB)

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Ordnance Department

Cincinnati Ordnance District
Redistribution & Salvage Section
Big Four Building, Cincinnati
Telephone: Ch. 3800—Ext. 552
Att: Capt. G. K. Ahers
(NR-SM-SI-OB-N)

San Francisco Ordnance District
Production Service Branch
100 McAllister St., San Francisco 1
Telephone: Underhill 3306—Ext. 144, 158
Att: S. Y. Armit
(NR-SM-SI-OB-N)

Pittsburgh Ordnance District
Redistribution & Salvage Branch
Chamber of Commerce Building, Pittsburgh
Att: Capt. William M. Mateer
(NR-SM-SI-OB-N)

Philadelphia Ordnance District
Redistribution & Salvage Section
150 South Broad Street, Philadelphia
(NR-SM-SI-OB-N)

Rochester Ordnance District
Redistribution & Salvage Section
1238 Mercantile Building, Rochester, N. Y.
(NR-SM-SI-OB-N)

St. Louis Ordnance District
Redistribution & Salvage Section
3663 Lindell Boulevard, St. Louis
(NR-SM-SI-OB-N)

Birmingham Ordnance District
Redistribution & Salvage Section
700 Frank Nelson Building, Birmingham
(NR-SM-SI-OB-N)

Boston Ordnance District
Redistribution & Salvage Section
140 Federal Street, Boston
(NR-SM-SI-OB-N)

Cleveland Ordnance District
Redistribution & Salvage Section
1006 Terminal Building, Cleveland
(NR-SM-SI-OB-N)

Detroit Ordnance District
Redistribution & Salvage Section
1832 National Bank Building, Detroit
(NR-SM-SI-OB-N)

Los Angeles Ordnance District
Redistribution & Salvage Branch
455 Chamber of Commerce Building, Los Angeles
Telephone: PR 2711
Att: Capt. William A. Cole—Fulton Lane
(NR-SI-OB-N)

New York Ordnance District
Redistribution & Salvage Section
80 roadway, New York
(NR-SM-SI-OB-N)

Chicago Ordnance District
Sales and Salvage Section
38 South Dearborn Street, Chicago
Telephone: Franklin 4900—Ext. 702
Att: Lt. R. J. Keck
(NR-SM-SI-OB)

Springfield Ordnance District
Redistribution & Salvage Section
95 State Street, Springfield, Mass.
(NR-SM-SI-OB-N)

Army Engineers Corps

U. S. Engineer Office
Providence
Telephone: Gaspee 5124—Ext. 7
Att: Capt. R. O. Jarvis
(NR-SM-SI-OB)

U. S. Engineer Office
Room 516, Merchandise Mart, Chicago
Telephone: Delaware 7620—Ext. 345, 335
Att: E. H. Taken or M. J. Ginsburg
(SI-OB)

U. S. Engineer Office
Denison, Tex.
Att: Capt. George B. Parks
(SM-SI-OB-N)

U. S. Engineer Office
P. O. Box 59, Louisville
Telephone: Jackson 1361—Ext. 55
Att: O. H. Bellis—E. E. Pontrich—W. J. Foy
(SM-SI-OB)

U. S. Engineer Office
Gay Building, Little Rock, Arkansas
Telephone: 2-3431—Ext. 210, 208
Att: J. E. O'Steer, Materials Section
(SI-OB-N)

U. S. Engineer Office
Fort Peck, Mont.
Telephone: 90 Ft. Peck
Att: Capt. L. E. Johnston, Executive Officer
(NR-SM-SI-OB)

U. S. Engineer Office
Missouri River Division Warehouse
Littleton, Colo.
Telephone: Spruce 2639
Att: Capt. K. E. Fowler, Officer-in-charge
(SI-OB-N)

U. S. Engineer Office
P. O. Box 1070, Nashville 1, Tenn.
Telephone: 5-4601—Sta. 34
Att: Property Section
(NR-SM-SI-OB-N)

U. S. Engineer Office
P. O. Box 1234, Cincinnati
Telephone: Main 5310—Ext. 18, 19, 20
Att: J. W. Dye—Miss F. Camins
(NR-SM-OB)

U. S. Engineer Office
Standard Oil Building, Baltimore
Telephone: Vernon 2600—Ext. 75, 87
Att: Lt. Col. C. A. Remaley and R. C. Linthicum
(NR-OB)

U. S. Engineer Office
Savannah, Ga.
Att: Capt. Wade
(SI-OB-N)

U. S. Engineer Office
Box 61, Tulsa, Okla.
Telephone: 29161 Tulsa—L. O. 222 Tulsa
Att: Capt. Lester Hagerbaumer
(NR SM-SI-OB)

U. S. Engineer Office
Missouri River Division Warehourse
Leavenworth, Kan.
Telephone: 95
Att: Ramsey J. Petersen (Contract Section)
(SM-OB-N)

U. S. Engineer Office
Albuquerque, N. M.
(NR-SM-SI-OB)

U. S. Engineer Office
Galveston, Tex.
(NR-SM-SI-OB)

U. S. Engineer Office
Fort Sam Houston, Tex.
(NR-SM-SI-OB)

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Maritime Commission

U. S. Maritime Commission
45 Broadway, New York
Capt. Granville Conway, District Manager
Att: A. B. Whitworth, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
310 South Michigan Avenue, Chicago
Telephone: Wabash 0021—Ext. 71
Att: N. M. Silverman, Acting District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
1072 Ledger Building, Philadelphia
Att: B. E. Prescott, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
22 Light Street, Baltimore
Julius Bouslog, District Manager
Att: J. B. Abbott, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
Seattle, Wash.
Att: John A. Kaufman, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
Twelfth & Monticello Avenue, Norfolk, Va.
G. F. Blair, District Manager
Att: L. A. Holman, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
Federal Office Building, New Orleans
C. H. Marshall, Gulf Coast Director
Att: Henry Samara, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
220 Bush Street, Mills Tower, 4 San Francisco
E. C. Mausshardt, District Manager
Att: T. J. Owen, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
P. O. Box 979, Savannah, Ga.
Att: George P. Monohan, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
Portland, Ore.
Att: Alfred S. Platou, District Purchasing Officer
(NR-SM-SI-OB)

U. S. Maritime Commission
112 West 7th Street, San Pedro, Cal.
Att: Kenneth F. Huntington, District Purchasing Officer
(NR-SM-SI-OB)

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Navy Department

Navy Department
Material Redistribution and Disposal Office
243 Madison Avenue, New York 17
Telephone: Mu 2-2535—Ext. 1
Att: Lt. (j.g.) J. R. Longeen, Officer-in-charge
(NR-SM-SI-OB-A-N)

Navy Department
Material Redistribution and Disposal Office
Room 1230, Board of Trade Building, Chicago
Telephone: Wabash 2900—Ext. 380
Att: Lt. M. D. May
(NR-SM-SI-OB)

U. S. Naval Training Station
Salvage Department
Building No. 2, Great Lakes
2300—Ext. 8179, 8176
Att: Lt. E. A. Mitchell or W. E. Turppa
(NR-SM-SI-OB)

Naval Air Station
Miami, Florida
Telephone: 7-5721
Att: Supply Officer
(SM-OB)

Naval Supply Depot
Seattle 14
Telephone: Al. 5200—Ext. 201
Att: Ensign E. Lageveen, Sales Officer
(NR-SM-SI-OB-N)

Naval Supply Depot
P. O. Box 2154, Spokane, Wash.
Telephone: Walnut 1581—Ext. 236
Att: Capt. J. E. McDonald, Supply Officer in Command, Mrs. June M. Higgins, Supervisor, Survey and Sales
(NR-SM-SI-OB-N)

Navy Yard
Brooklyn
Telephone: Cumberland 6-4500—Ext. 617
Att: Supply Officer
(SM-OB)

U. S. Naval Ordnance Plant
South Charleston 3, W. Va.
Telephone: 4162
Att: Supply Officer
(NR-OB)

Norfolk Navy Yard
Portsmouth, Va.
Att: Supply Officer
(NR-OB)

Navy Department
Material Redistribution and Disposal Office
1355 Market Street, San Francisco
Att: Officer-in-charge
(NR-SM-SI-OB)

Naval Supply Depot
Mechanicsburg, Pa.
Telephone: Harrisburg 47951 — Ext. 271
Att: Lt. (j.g.) L. J. Barry, Sales Officer
(NR-SM-SI-OB)

Puget Sound Navy Yard
Bremerton, Washington
Telephone: Bremerton 5000—Ext. 07-314
Att: Survey and Sales Officer, Supply Department, PSNY
(NR-SM-OB-N)

Naval Training Station
Building M-12, Sampson, N. Y.
Telephone: Geneva No. 9, Ext. 333
Att: Supply Officer
(NR-OB)

Naval Air Station
Alameda, Calif.
Telephone: Lakehurst 3-2200—Ext. 817
Att: Supply Officer
(NR-SI-OB-N)

U. S. Naval Air Station
Material Conservation and Reclamation Section
Supply Department
Quonset Point, R. I.
Telephone: Wickford 500—Ext. 607
Att: Lt. (j.g.) E. J. McComb, Assistant Supply Officer
(NR-OB)

U. S. Naval Station
New Orleans (Algiers)
Telephone: Algiers 3360
Att: Supply Officer
(NR-OB)
(Additional Naval Supply Depots will be listed in subsequent bulletins)

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Miscellaneous Listings

First Service Command
808 Commonwealth Avenue, Boston 15
Salvage and Redistribution Division
Telephone: Bea 1300—Ext. 140, 142
(NR-SM-SI-OB)

Ninth Service Command
Salvage Segregation Center
Berkeley, Cal.
Telephone: Berkeley 7130
(NR-OB)

New Cumberland ASF Depot
New Cumberland, Pa.
Telephone: 44961—Ext. 55
Att: Lt. Robert E. Cree, Salvage Officer
(NR-SM-OB)

Memphis ASF Depot
Office of Salvage Officer
Memphis, Tenn.
Telephone: 48-4431—Ext. 258
Att: Lt. C. A. French, Depot Salvage Officer
(NR-SI-OB)

Boston Quartermaster Depot
Salvage Section
855 Commonwealth Avenue, Boston
Telephone: Liberty 6000—Ext. 167
Att: Lt. I. M. deGarmo, Salvage & Reclamation Officer
(NR-SM-OB)

Post Salvage Officer
Camp Phillips, Kan.
Telephone: 4500—Ext. 145
Att: Lt. Robert E. Furbee, QMC
(NR-OB)

Office of Director of Supply Division
Salvage Branch
Camp Breckinridge, Ky.
Telephone: 600—Ext. 339
Att: Lt. Joseph A. Galard, QMC
(NR-SM-OB)

Salvage Officer, Salvage Section
Maintenance Branch
Fort Knox, Ky.
Telephone: Ft. Knox 2-1115 or 2-3244
Att: Capt. W. E. Brown
(NR-OB)

Aloe Army Air Field
Quartermaster
Victoria, Tex.
Telephone: Victoria 2460—Ext. 140
Att: Lt. Col. Dudley B. Jones
(NR-SM-SI-OB-N)

Army Air Forces, Material Command
Redistribution and Salvage Section
Midcentral Procurement District
111 West Jackson Boulevard, Chicago
Telephone: Harrison 6140—Ext. 85
Att: Capt. John N. Failing
(NR-SM-SI-OB-N)

Harding Field
Office of the Supervisor of Supply
Purchasing and Contracting Section
Baton Rouge 5, La.
Telephone: 35771—Ext. 268
Att: Lt. Asa S. Reeves, Purchasing and Contracting Officer
(NR-OB)

Army Air Base, Stout Field
Office of the Base Quartermaster
Indianapolis
Telephone: Belmont 5240—Ext. 110
Att: Capt. K. G. Sellberg, QMC
(NR-OB)

Office of the Quartermaster
AAFPS (SP-4E) HAAF
Hobbs, N. M.
Telephone: 1200—Ext. 127
Att: Capt. E. R. Lillienthal, QMC
(NR-SM-OB)

Fort Devens
Ayer, Mass.
Att: Salvage Officer
(NR-SM-OB)

Rock Island Arsenal
Rock Island, Ill.
Telephone: Rock Island 8000—Ext. 882
Att: Capt. H. W. Gerlach, Redistribution and Salvage Officer
(NR-SM-SI-OB-N)

Rocky Mountain Arsenal
Denver
Telephone: Keystone 1192—Ext. 274
Att: Capt. R. J. Keating, Lt. L. Rubinger
(NR-SM-SI-N)

Pine Bluff Arsenal
Pine Bluff Arsenal, Ark.
Telephone: 461
Att: Lt. Martin D. Danford, Redistribution and Salvage Officer
(NR-SM-SI-OB-N)
Purchasing & Contracting Branch

Camp Gruber, Okla.
Telephone: 7456—Ext. 476
Att: Lt. Stanley B. Dwork, Salvage Officer
Att: Capt. J. W. Cohen, Purchasing Officer
(NR-SM-OB)

Office of the Salvage Officer
Camp McCain
Grenada, Miss.
Telephone: 600—Ext. 496
Att: Lt. Bert L. Aber, QMC
(NR-OB)

Office of the Quartermaster
Halloran General Hospital
Staten Island 2, N. Y.
Telephone: Gibraltar 2-7700—Ext. 340
Att: Major Cleon W. Goodnough, Purchasing & Contracting Officer
(NR-OB)

Bluff City Shoe Reconstruction Factory
Hannibal, Mo.
Telephone: 2900—Ext. 47
Att: Capt. Cecil T. Doll, QMC
Att: Lt. James F. Frain, QMC
(NR-OB)

830th AAF Specialized Depot
3300 Jackson Ave., Memphis 1, Tenn.
Telephone: 48-4411—Ext. 35, 55
Att: Major Carlton G. George, Contracting Officer
(SM-SI-OB-N)

Salvage Officer
Camp Swift, Tex.
Telephone: Ext. 801
Att: Lt. John T. Law, Post Salvage Officer
(NR-SM-OB)

New York Chemical Warfare Procurement Division
292 Madison Avenue, New York 17
Att: Captain Bernard Marculis, Redistribution and Salvage Officer
(NR-SI-OB-N)
Pittsburgh Chemical Warfare Procurement District
600 Grant Street, Pittsburgh 19
Telephone: Grant 1081—Ext. 244
Att: Lt. Robert J. Sims, Redistribution and Salvage Officer
(NR-SM-SI-OB)

St. Louis Medical Depot
12th and Spruce Streets, St. Louis
Telephone: Central 5484—Ext. 430
Att: Capt. Arthur D. Sullivan, Salvage Officer
(NR-OB)

Kansas City Medical Depot
Kansas City Food Terminal, Kansas City 15, Kan.
Telephone: At. 3400—Ext. 20
Att: Lt. William B. Cowden, Salvage Officer
(NR-OB)

Kansas City Quartermaster Depot
601 Hardesty Avenue, Kansas City 1
Att: Capt. Elgin T. Fuller, Contracting Officer
(NR-OB)

Second Service Command
Reclamation & Salvage Division
Office of Director of Supply
Governors Island, New York
Telephone: Whitehall 4-7700—Ext. 37
Att: Lt. Colonel Raymond G. Weeks, QMC Chief
(NR-OB)

Sixth Service Command
Salvage and Redistribution Division
20 North Wacker Drive, Chicago
Telephone: Randolph 1311—Ext. 225
Att: Maj. R. T. Gheen
(NR-SM-SI-OB)

Army Service Forces, Quartermaster Depot
1819 West Pershing Road, Chicago
Telephone: Lafayette 5500—Ext. 272
Att: Lt. W. C. Polley, Salvage Officer
(NR-SM-OB-N)

Surplus Goods Disposal Argued; Congress May Legislate on Question

Washington

• • • **Postwar** surpluses, as well as industrial plans for the postwar period, are being given a thorough airing on Capitol Hill. John M. Hancock, New York investment banker, co-author of the Baruch-Hancock report appeared before the House Banking and Currency Committee on March 22. The committee has been considering HR 4420, a bill to give surplus disposal authority to the RFC, under policies fixed by Congress.

Mr. Hancock asked the committee not to enact HR 4420 or any other legislation at present, but to give the Surplus War Property Administration, created by executive order, an opportunity to try its hands at surplus disposal for at least another two months. He did not think legislation would correct any of the evils cited by Congress regarding sales of surplus material any better than would Will Clayton, SWPA chief, operating under executive order.

This testimony brought a storm of protest from certain committee members who commented vociferously on the possibility of surpluses being used for political purposes if they were handled under an executive order of the President. The committee seemed to be in agreement that the problem should be handled under policies laid down by Congress, without allowing the executive to amass any more power.

Representative Wright Patman, rock-ribbed New Dealer from Texas, sponsor of HR 4420, agreed with his

colleagues that authority to dispose of surpluses should be designated by legislation, although he said that he thought his fellow-Texan, Mr. Clayton, could handle the job admirably.

The feeling in Congress that the President has stolen the ball, led Washington observers to predict that Congress will legislate on the surplus property question, and wipe out the Surplus War Property Administration. The designation of Treasury Procurement as the agency to dispose of consumer goods in the executive order establishing SWPA brought much resentment from the committee, which has been violently critical of the agency's methods.

Mr. Hancock said that Treasury Procurement should be allowed to dispose of consumer goods. He also pointed out that it was his belief that a better job will be done by the four established agencies, RFC, Maritime Commission, Treasury Procurement and the War Food Administration, designated by SWPA to dispose of surpluses, than would the new body, under RFC, to handle the entire problem as requested in HR 4420.

The New York banker said surpluses should be disposed of quickly and in as large a quantity as possible during the war.

Mr. Hancock was firm in his statement that no new agency should be set up to handle surpluses, other than a small group like SWPA to handle policy, which would presumably not get into actual administration.

He said that enactment of legislation regarding contract termination, in his opinion, was more urgent than legislation on surpluses.

Meanwhile, in another House hearing room Charles E. Wilson, president of General Motors, was telling a special postwar committee that his company was prepared to spend $500,000,000 on a postwar expansion program, double its prewar employment and add 10 new plants.

Mr. Wilson said he did not favor anything like mustering-out pay for warworkers when the war ends. He felt that industry could reconvert quickly, and that most workers would welcome a short vacation.

Although he expects industry to be about 10 per cent converted when the war is over, Mr. Wilson said the reconversion speed of the automobile industry will be dependent on the following factors—removal of government equipment, making government tools available, and allowing some reconversion to begin as soon as possible.

Would-be Buyers Numerous as Aircraft Builders Show Surpluses

New York

• • • **Displays of** surplus inventories representing a book value of at least $50,000,000 are on exhibit this and next week in New York. Five of the largest eastern aircraft producers and the regional WPB office launched this display to dispose of surplus critical materials that cannot be used in current combat aircraft production. Results of this display will be watched closely by representatives of the government and industry in the hope that they may point a way to faster and more effective elimination of surplus goods. Aircraft producers participating in the two-week show are: Bell Aircraft Co.; Eastern Aircraft, division of General Motors; Eclipse-Pioneer division, Bendix Aviation Corp., Glenn L. Martin Co., and Republic Aviation Corp.

Included in the exhibit are considerable stocks of raw materials, such as steel, aluminum, and brass rods, bars, sheets, strip, and tubing, as well as finished products and tool steels. Likewise, there are considerable quantities of perishable tools, such as drills, milling cutters, reamers, dies, chasers, tool bits, and emery wheels. Among the hardware items shown are belts, pipe straps, hinges, paints, gaskets, nuts, bolts, screws, rivets, springs, lockwashers, dowel pins, cotter pins, pipe plugs, etc. Various types and sizes of bearings and electrical supplies, abrasive wheels, plumbing supplies and fittings are also shown.

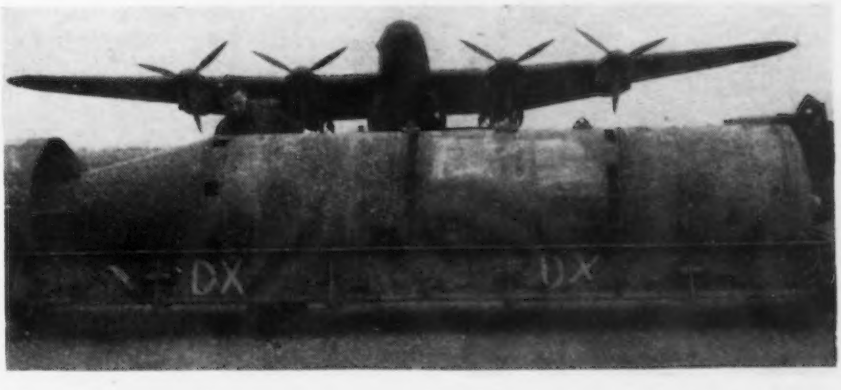
The exhibition of these surplus commodities by the aircraft companies, it was pointed out, does not indicate a let-up in war production through cancellations nor does it necessarily indicate over-buying. More frequently, it is the result of changes in aircraft specifications. However, as pointed out by representatives of one aircraft company, surpluses occasionally have been the result of over-buying especially for new programs.

By noon of the first day of the exhibit, more than 300 prospective buyers had visited the exhibits. Representatives of wholesale hardware companies, mail order houses and department stores were attempting to place bids for the material they desired before they left the exhibit. Small manufacturers, likewise, took keen interest in specific items, especially those in unfabricated form or in the first stages of fabricating. It is believed that many of the items offered for sale will be utilized in construction projects. Some of these might well be aluminum strip and angles for tile edging in bathrooms; iron, brass, and steel pipe fittings; and electrical wiring and conduit.

There will be no relaxations of WPB limitation or material orders to get rid of this surplus material. Prospective purchasers must fulfill all requirements for use as established by such orders for the desired items.

Many purchasers, such as hardware jobbers and mail order houses, find the chief advantage in obtaining this material is that it is available for immediate delivery. Frequently they have similar or identical items on order from regular suppliers but deliveries are extended well into the latter part of the year. With dwindling supplies on the shelves of these business houses, it is advantageous to obtain these supplies.

SIX-TON FORGET-ME-NOT: *Here is a 12,000 lb. bomb, similar to the ones being dropped on industrial plants in Germany and occupied France. The plane is a British Lancaster.*



Preference Rating Rules Revised; All Defense Orders Rated AA-5 or Higher

Washington

• • • **Basic rules** governing the use of preference ratings have been revised to bring them up to date and make certain operating changes, WPB has announced. In the future, all defense orders will be rated at least AA-5. Defense orders are defined in Priorities Regulation No. 1 as purchase orders calling for delivery to or for the account of the Army, Navy, Maritime Commission, and other government agencies concerned with the war effort or lend-lease orders. Formerly, all defense orders that were not specifically assigned a higher rating were rated A-10.

The amendments provide that in the future no ratings lower than AA-5 will be assigned by WPB. However, outstanding ratings assigned prior to March 18 lower than AA-5 may continue to be used.

The changes in PR No. 1 as amended specifically indicate that any person who receives a rated order and is able to fill it on the required delivery date must notify his customer of the earliest date on which he will be able to fill the order. In such cases, the person who received the order has the choice of two actions: 1—To reject the order and notify his customer when he would have been able to make delivery, or 2—To accept the order for the earliest delivery date he expects to be able to meet and notify his customer of such date. This customer notification provision has been inherent in WPB policy, but has never been spelled out in the regulation.

Rated orders may be rejected under the terms of PR No. 1 if the person placing such orders is unwilling to meet established prices and terms of sale of the person with whom he has placed the order. The amendment provides that suppliers must quote established terms and prices upon request of persons who want to place rated orders with them unless such a quotation would involve detailed engineering or accounting work. In such cases, the supplier may quote his best estimate without such work and point out that it is not binding. However, a supplier need not quote his prices and terms to a person with a rating if he would not be required to accept such a person's rated purchase order and knows that he would not accept it if it were served on him.

In addition, a person may reject a rated order that is served on him for an intermediate product (a product that he purchases or makes for his own use only), provided he has not filled any orders for such material or product within the past two years. However, if he has accepted an order for such a product within the previous two-year period, he must accept rated orders placed with him for such product unless they would interfere with equal or higher rated orders already on hand, either for the intermediate product or for his finished product.

Specific rules are made for the treatment of orders placed with preference rating originally assigned on a certificate that has been cancelled. In such cases, the person whose rating authority has been cancelled must either cancel all orders placed with the rating or inform suppliers that orders so placed are no longer to be treated as rated orders. A supplier who receives such a notification must immediately withdraw all extensions of that rating that he may have made on his own purchase orders.

Provisions of PR No. 1 also have been amended to indicate that purchase orders may require delivery within a 31-day period as well as specify a specific delivery date or dates. In addition, the amendment provides that in four instances orders need bear no specific delivery dates if it is understood that they require delivery as soon as possible or customary. These four cases are: 1—Orders for maintenance, repair or operating supplies that are properly identified, 2—Orders placed with or by distributors or jobbers, 3—Small orders involving not more than $100, and 4—Emergency orders rated AAA.

The amendment provides that if a person accepted a rated order and later finds that he will be unable to make delivery within 15 days of the required delivery date, he must notify his customer of such fact and the approximate date he will be able to make delivery. This provision is similar to a provision that has been written into CMP Regulations.

Relative to disposition of idle and excessive equipment or material by a person who does not regularly sell it, the amended regulation provides that a holder of such material may use it for his own purposes if he is able to fulfill the conditions applying to pur-

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THE "DOTTY JANE": *After a raid, this U. S. 8th Air Force Flying Fortress, the "Dotty Jane," came home badly riddled by flak. The ship's radio operator was lost when the radio room received a direct hit.*

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chases at special sales under the provisions of PR No. 13. Such materials, however, may be used only for purposes permitted under existing WPB "L" and "M" orders.

The revision also provides that orders and regulations of WPB shall not apply to military and naval establishments outside the 48 States and the District of Columbia, unless the orders themselves specifically indicate that they do so apply.

Record-keeping requirements of Priorities Regulation No. 1 have been modified in two respects. They are:

1—Whenever a WPB order or regulation requires that a person restrict his production according to a base period quota, he must keep a record of his base period operations, and preserve it, together with any work sheets showing his calculations, for WPB inspection for as long as the restriction remains in force and for two years thereafter.

2—Whenever a person is restricted as to amounts of materials he may use on the basis of quota restrictions, authorized production schedules, limitation orders, special directives, or similar devices, he must keep reasonably accurate records of the materials consumed and of production to show whether he is complying with the restrictions.

Other changes are made in the order for the purpose of clarifying existing rules and regulations that are applicable to the operation of the priorities system.

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OPA Grants Steel Price Increases

Washington

• • • **The OPA recently** issued decisions on requests of various iron and steel products manufacturers for adjustments of prices on specifically named products. American Swedo Iron Corp., Danville, Pa., was permitted to charge $100.50 per gross ton for wrought iron melting bars and $96 per gross ton for staybolt muck bars, f.o.b. Danville. W. H. Mace Co., Peru, Ill., has been permitted a maximum price for Zinclad nails of 40c. per 100 lb. above the ceiling price established in RPS No. 6 for the particular size and type of nail. Also, for spiral nails made by W. H. Maze Co., a maximum price of 35 per cent per 100 lb. above the ceiling for the particular size and type of nail may be charged.

A request from Empire Sheet & Tin Plate Co., Mansfield, Ohio, for an increase in steel ingot prices was denied, as was another request from this company for a further increase in the price of hot rolled black carbon steel sheets to $2.60 per 100 lb. Previous price relief was granted on this product, setting the company's ceiling at $2.45 per 100 lb. mill base with differentials, transportation charges, etc. Continental Steel Corp., Kokomo, Ind., is permitted a maximum base price for galvanized sheets and galvanized form roofing sheets produced at its Chapman Price Division, Indianapolis, of $3.75 per 100 lb., No. 24 gage base, f.o.b. Indianapolis.

Sheffield Steel Corp., Kansas City, requested an adjustment in RPS No. 6 of the transportation charges used in computing the maximum prices for high tensile steel bars. Sheffield had been requested to manufacture a new product, a high tensile bar, similar to Carnegie-Illinois' Man-Ten, on which the maximum base price is $2.65 per 100 lb. Since Kansas City is not a basing point for this product and a freight absorption of 46c. per 100 lb. must be made on shipments east of Chicago, an adjustment was permitted. Sheffield is permitted to sell these high tensile steel bars on an f.o.b. Kansas City basis. Maximum prices for all shipments of these bars must be computed on a Kansas City basis since it would not be consistent with the intention of the order to permit the seller to use the basing points as otherwise established where they would work to the seller's advantage.

•

Steps Outlined for Making Extra MRO Quota Requests

Washington

• • • **Information which** should be given by persons applying for increases in maintenance, repair, and operating supply (MRO) quotas under CMP Regulation No. 5, has been spelled out in Direction No. 18 to that regulation.

Items of information that should be included are:

1—Name of products manufactured or description of services rendered;

2—Quarterly quota authorized under paragraph (f) in 1943. (If operating on a seasonal basis, show for each quarter of 1943). If a special authorization was received for any quarter, show that for each such quarter in addition to the "base" quota; 3—Statement of total dollar value of deliveries of plant product in 1942, and first and subsequent quarters of 1943, by quarters. Show deliveries for each quarter by principal Claimant Agencies; 4—Statement of total amount of MRO requested to be authorized per quarter. This should include the base quota already permitted by paragraph (f) (1), (2), or (3) plus the increase requested; 5—Statement of total amount expended during 1943 for minor capital additions under paragraph (b) (3) of the regulation; 6—Statement of deliveries of company product scheduled for quarters for which MRO increase is requested; and 7—Any additional information that may be pertinent to proper evaluation of the application.

If any of the above questions do not apply to a specific business, information comparable to that requested should be set forth in the applicant's letter. All such applications should be filed with the War Production Board, Washington 25, D. C., Reference: CMP Regulation No. 5.

This list is important in view of the recent amendment to CMP Regulation No. 5, which permits a person who has been granted an increased MRO quota, for other than a special circumstance such as retooling, to continue to use such increased quota during quarters subsequent to the one for which it was originally granted.

•

Stainless Permitted in Flatware Manufacture

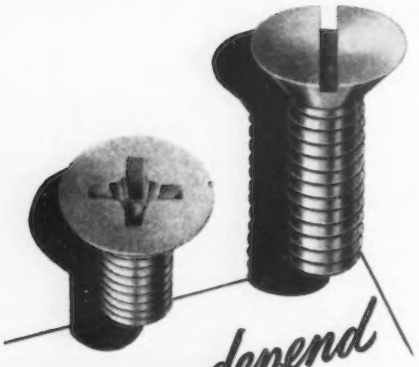
Washington

• • • **Flatware manufacturers** have been granted permission to use chromium stainless steel other than that obtainable from distressed stocks in making knives, forks, and spoons for sale to hospitals, war plant cafeterias, hotels, restaurants, and other institutional users since Nov. 5, 1943. Prior to that time the use of stainless steel was prohibited except for military orders.

The production program now provides for about 17,000,000 pieces of stainless steel flatware per quarter. During the first quarter of 1944, flatware made of stainless steel from distressed stocks totaled only about 3,000,000 pieces. Stainless steel flatware for home use is still prohibited.

Since Jan. 1, 1944, production of flatware for both military and nonmilitary orders has been on a quarterly quota basis. For each quarter, manufacturers are assigned a production quota in accordance with the predetermined program requirements for that quarter. Availability of facilities and manpower in which the manufacturer's plant is located are taken into consideration in assigning quotas.

Finished weight specifications and other minor limitations have been removed on flatware made of stainless.



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WPB Warns Against Excess Inventories of Pig Iron

Washington

• • • **While pig iron** is no longer allocated, WPB pointed out to consumers in a letter this week that inventory restrictions continue in force. The letter read as follows:

To All Consumers of Pig Iron:

"Under date of Dec. 22 you were advised that the allocation of pig iron under order M-17 would be discontinued. Consumer forms WPB-3172 and WPB-3173 were eliminated and consumers were authorized to make direct arrangements with producers for their required supplies.

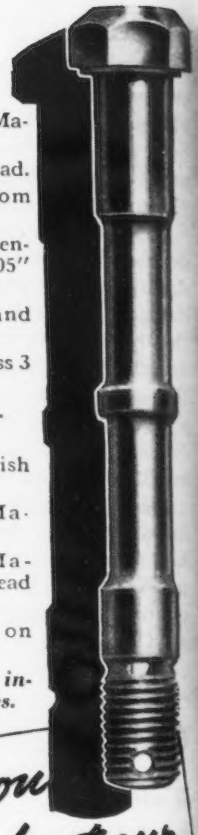
"Note, however, that inventory and other restrictions of WPB orders are still in effect. For example, we particularly draw your attention to Section 944.14 of Priorities Regulation No. 1. In effect, this prohibits the delivery or acceptance of any material if it results in an inventory in excess of the 'practicable *minimum working inventory*,' reasonably necessary on the basis of current method and rate of operations. This term is to be strictly construed. The mere fact that the rate of turnover has increased or that materials are difficult to obtain does not justify maintaining inventories above the minimum with which operations can be continued. Producers and consumers of pig iron will continue to be governed by this rule."

Galvanized Producers Again Receive Extra Steel Quota

Washington

• • • **Each manufacturer** of galvanized pails and buckets, wash tubs, wash boilers, funnels, fire shovels, and storage cans for petroleum products has been granted a supplementary quota of iron and steel for use in the second quarter of 1944. This will permit manufacturers of these items to continue to use iron and steel at the same rate as in the first quarter of this year, when they were given supplementary quotas which brought their permitted rate of usage from 50 to 92½ per cent of the quarterly average in the year ended June 30, 1941.

Whether production will reach the permitted rate will be contingent upon the ability of the manufacturers to obtain material from the rolling mills to the extent of their allotments and upon the labor situation. This action has been effected by direction 2 to limitation order L-30-a.



1. Automatic Screw Machine — ***inspection.***
2. Disc grind hex head.
3. Break hex bottom corners.
4. Form grind in Centerless Grinder to .0005" — ***inspection.***
5. Undercut on Hand Screw Machine.
6. Roll thread to Class 3 limits — ***inspection.***
7. Jig drill cross hole.
8. Countersink.
9. Disc Sander: finish top of head.
10. Hand Screw Machine. rethread.
11. Hand Screw Machine: finish-form head chamfer.
12. Break corners on chamfer.
13. ***Final complete inspection with gauges.***

Have you heard about our Operations?

This simple part *could* have been turned out in three or four basic operations. *But we performed no less than thirteen with four precision inspections* . . . to make this bolt a better aircraft engine part.

This efficient route requires a vast amount of equipment and experience. Corbin has both — ready to supply your precision parts exactly — *and economically*.

Some of our facilities may be available *now*. Send us your blueprints and specifications for prompt, helpful study of your precision requirements.

THE CORBIN SCREW CORPORATION
The American Hardware Corporation, Successor
NEW BRITAIN, CONNECTICUT
P-1A

CORBIN
PRECISION PARTS

Actual photograph 1½ times size of examples of small shapes drawn from converted round hole standard Carboloy dies in a well-known mill.

"Drawn Through Carboloy Dies"

. . . Your Assurance of Highest Quality!

Shape wire, or bars, drawn through Carboloy Cemented Carbide Dies have these outstanding features: Surface finish of an unusually high order—practically "mirror-like" in quality; close tolerances with uniform size throughout the entire length of coil; accurate maintenance of all contours, including "sharp," or controlled-radius corners when desired.

To bring the benefits of cemented carbide die use to this field, Carboloy Company maintains comprehensive service for mills drawing shape wire, providing complete recommendations for die finishing and servicing equipment—including accessories—plus a period of specialized training in our Detroit Training Course.

This service is another phase of "Carboloy Service Beyond The Sale"—reaching throughout the entire field of cemented carbide use.

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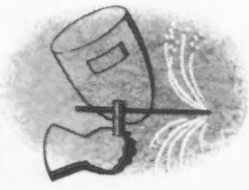

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Cut production costs by purchasing **PAGE** Shaped Wire—produced to your own special requirements. Shaped Wire has definitely inserted itself into new and timely production methods and has saved industry many precious production hours. Supplied in Carbon Steels, Armco Ingot Iron, Stainless Steels—in sectional areas up to .250 inches square and widths up to 3/8 inches.

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Metal Working and Machining Patents Listed This Week

• • • **This is the** twentieth list of seized enemy patents available on license from the Alien Property Custodian. These patents are grouped in classes. In the following lists, subclass numbers are shown first in parentheses, followed by the patent number, description of the patent, the inventor's name and nationality, and the date the patent was issued.

This series began in the Nov. 4 issue of THE IRON AGE, page 95, at which time rules and procedures for obtaining the patents were described along with full information about their usage and possibilities. Seized patent applications were listed in THE IRON AGE on July 8.

Class 29—Metal Working

(1) 1,901,790. Portable work bench constructed so that operations of every kind, including those involving the expenditure of considerable force, can be carried out. Gerhard Wolfram, Germany. 3-14-33.

(1) 2,118,205. Apparatus for briquetting metal shavings, particularly woolly, tenacious shavings. Kurt Klone, Germany. 5-24-38

(1) 2,233,869. Apparatus for cold working round, or nearly round, metal bars of commercial quality, such as round iron rods, by means of twisting. Ernst Lukacs, Hungary. 3-4-41.

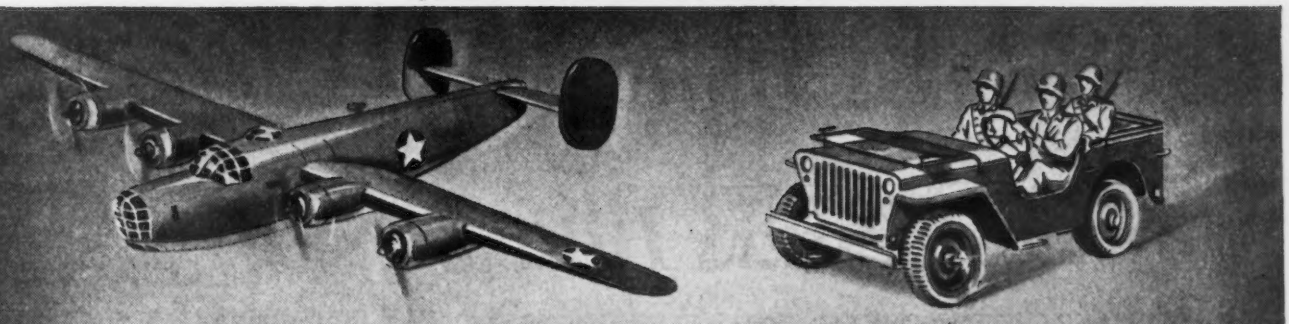
(1.22) 1,895,207. Method of forming projectiles in which the bearing surface of the projectile is also provided with groups of comparatively deep and very narrow grooves which are filled with a lubricant. Otto Rinkel, Germany. 1-24-33.

(3) 1,795,559. Method of producing flap sliding buckles for braces or the like. Heinrich Hellmann, Germany. 3-10-31.

(4.50) 1,647,371. Method and apparatus for regenerating waste metal such as tin boxes, enameled metal, etc. Richard Philipp, Germany. 11-1-27.

(4.50) 1,665,806. Method of disintegrating

AIRPLANE MOTOR: *This is a "tailor-made" motor that will serve as the engine to drive the propeller of a small wind tunnel model airplane.*



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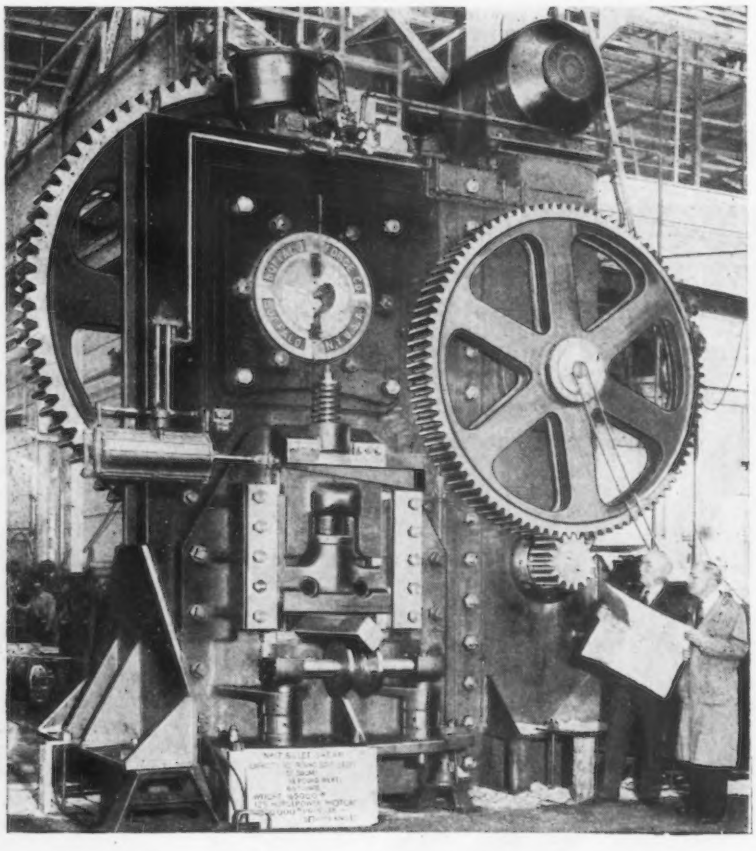
for SUPER *Billets*



This Giant "Buffalo" Shears 10" Billets...6 a Minute!

● A significant achievement in metal working machines, this huge "Buffalo" Billet Shear puts the cutting of massive billets on a fast production basis.

Axel, crankshaft, shell and other heavy forging stock are readily turned out by the "Buffalo" Billet Shear accurately and with unusual simplicity of control. The construction of this machine is ably geared to the job in hand—built of armor plate steel with electric welded frames. Every detail embodies strength and design factors to exert 4½ million pounds of pressure on the shearing blades—and perform without let-up on a 24-hour-a-day schedule.

"Buffalo" Billet Shears are offered in eleven standard sizes. Engineering details in Bulletin 3295.

BUFFALO FORGE COMPANY
492 Broadway, Buffalo, N. Y.
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

"Buffalo" **BILLET SHEARS**

turnings in which the foreign bodies contained in the material, which interfere with the disintegrating process, are separated out by means of a current of a fluid medium. Julius Bing, Germany. 4-10-28.

(4.50) 1,687,886. Disintegrating apparatus comprised of a substantially conical hopper having stationary disintegrating means secured to its inner wall. Richard Philipp, Germany. 10-16-28.

(6) 1,994,863. Method of manufacturing cranks by forging a hollow cylindrical work piece. Friedrich Nierhaus, Germany. 3-19-35.

(16) 1,818,111. Method of manufacture of wire chain for jewelers' trade. Richard Wirth and Wilhelm Bittrolf, Germany. 8-11-31.

(17) 1,621,502. Gold-beater's foil formed of cellulose hydrate. Saly Freund and Bertram Stauffer, Germany. 3-22-27.

(17) 1,749,075. Apparatus for separating adhering rolled metal sheets. Eugen Hinderer, Germany. 3-4-30.

(17) 1,923,264. Apparatus for separating adhering rolled sheets including the combination, with means for positively moving a pair of adhering sheets in a feeding direction, of a pair of superposed cutting devices. Eugen Hinderer, Germany. 8-22-33.

(18) 1,701,889. Method of manufacturing sheets and long strips of metal by peeling off the sheets or strips from the cast ingots by cutting tools under temperature conditions under which the metal to be treated assumes a plastic or moldable state. Otto Junker, Germany. 2-12-29.

(18) 1,785,283. Process for producing lamelliform metal powders. Emil Podszus, Germany. 12-16-30.

(18) 1,792,377. Method of rolling out plates, sheets and bands by passing the iron through rolling mills comprising a pair of working rolls of small diameter so supported by counter-pressure rolls that the working rolls cannot yield in any direction. Franz Jordan, Germany. 2-10-31.

(18) 1,832,868. Method of manufacturing foil-shaped metal grains. Erwin Kramer, Germany. 11-24-31.

(18) 1,930,684. Method of manufacturing bronze colors. Erwin Kramer, Germany. 10-17-33.

(20) 2,065,098. Method of making plaquets for spectacles or eye-glasses. Hans Rollbuhler and Walter Dobbelin, Germany. 12-22-36.

(21) 1,947,843. Apparatus for trimming and grooving electrotype plates and the like. Otto Ganskow, Germany. 2-20-34.

(26) 2,216,403. Automatic drilling and riveting machine for fixing countersunk rivets in long plates for use particularly in aircraft construction. Otto Oeckl, Karl Weinhold and Wilhelm Pleines, Germany. 10-1-40.

(27) 1,771,833. Machine for making shaped pieces in the form of bolts, screws or other profiled articles in continuous operation from a work-piece in the form of a rod or wire. Gustav Arnold, Germany. 7-29-30.

(27) 1,858,414. Method and machine for manufacturing taper pins indented automatically from a wire. Wilhelm Nollenburg, Germany. 5-17-32.

(27) 1,915,708. Machine for drilling and milling rails by combination machine frame, a milling cutter head on said frame for milling the ends of the rails, a plurality of drilling mechanisms associated with said frame on one side of the milling head. Alfred Wirth, Germany. 6-27-33.

(27) 2,249,146. Watchmaker's lathe provided with electric drive. Rudolf Krug, Germany. 7-15-41.

(28) 2,018,123. Machine for finishing armor plate piercing shells; provided with rotary grinding devices respectively adapted to the finishing of the fore ring and the ogival head of the shell with extreme precision. Vincenzo Flagiello, Italy. 10-22-35.

(29) 2,135,640. Horizontal face plate lathe with two columns. Anton Holtmeier, Germany. 11-8-38.

(33) 1,970,205. Automatic rod drawing and cutting machine comprising oppositely reciprocating drawing carriages and a reciprocating cutting mechanism adapted to move with the rod at a given moment and cut same into predetermined lengths. Conrad Thyssen, Germany. 8-14-34.

(33) 1,976,357. Double acting and automatic machine for inserting, drawing, straightening and polishing rods. Heinrich Moller, Germany. 10-9-34.

(33) 2,190,611. Apparatus for manufacturing metallic parts with wear-resistant surface layers incorporated therein. Gustav Sembdner, Germany. 2-13-40.

(33) 1,659,216. Machine for manufacturing pins of the type in which the wire the pins are made from is intermittently advanced by means of grippers or tongues. Hans Prym, Germany. 2-14-28.

(33) 1,715,812. Method and apparatus for

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6. No Square Sliding Shafts or Differential Drives.
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Every step in the manufacture of LIONITE, from the electric furnace to the final grading operation, is held to rigid standards. A final sample is taken from the shipping container and checked for Grain Size, Capillarity, Grain Shape, Surface Treatment, Specific Gravity, Temper and Toughness. By such careful control is the quality of your polishing protected when you use LIONITE.

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GENERAL ABRASIVE COMPANY, INC.

Lionite and Carbonite Abrasive Grains

NIAGARA FALLS, NEW YORK, U. S. A.

manufacturing openers for sheet metal, especially shoe-cream boxes, said openers comprising a hollow rivet turned inside out like a sack. Friedrich Bauer, Germany. 6-4-29.

(33) 1,775,555. Process and device for producing ribbed tubes with smooth ribs. Heinrich Dorndorf, Germany. 9-9-30.

(33) 1,860,758. Machine for fastening reeds on the sound plates of reed instruments such as accordions without rivets. Max Weidlich, Germany. 5-31-32.

(148.20) 1,886,396. Method of preventing the formation of waves or bends in thin walled metal articles when reinforcing the same by casting a metal layer thereon. Adolf Hainlen, Germany. 11-8-32.

(33) 1,887,885. Device for the production and insertion of the wire spirals into the ring sleeves of snap rings. Bernhard Forster, Germany. 11-15-32.

(33) 1,899,114. Machine for manufacturing dry cells in which the closing of the zinc cups with paper covers or the like, the fitting of the caps on the carbon rods and the soldering of the pole wires on to the zinc cups is effected mechanically, excluding all hand work. Edmund Schmidt, Germany. 2-29-33.

(33) 2,258,378. Machine for preparing pneumatic tires for retreading. Nanno Collmann, Germany. 10-7-41.

(33) 1,936,790. Tube-drawing bench in which the mandrel is detached from its shaft after the working stroke and the drawn tube is stripped from the mandrel outside the bench and is conveyed to a collecting and cooling grid. Heinrich Heetkamp, Germany. 11-28-33.

(33) 1,910,214. Automatic machine for producing spring ring casings in a continuous operation. Karl Durr, Germany. 5-23-33.

(33) 1,924,962. A combined pressing and rolling mill for finishing preformed blanks of wheels, rollers, pulleys and the like. Josef Rosenbaum, Germany. 8-29-33.

(34) 2,078,702. Device whereby ingots of cruciform cross-section can be cored, divided, and condensed. Ignatz Urbaniak, Germany. 4-27-34.

(34) 1,922,751. Machine tool for notching and circular trimming of flat and sectioned bars. Johann Thiermann, Germany. 8-15-33.

(35) 2,268,472. Angular section ingot for piercing in a press by the Ehrhardt method and arrangements for shaping such ingots. Karl Bungeroth and Heinrich Heetkamp, Germany. 12-30-41.

BRAZILIAN STEEL MAN: *Dr. Louis J. Ensch, right, Brazilian industrialist, flew to Washington to confer on Brizilian steel production with U. S. officials. He is general manager of Cia. Siderurgica Belgo Mineira, which is at present Brazil's leading steel producer. Ensch was greeted by Capt. G. Kronsbrk, military attache at the Luxemburg embassy in Washington.*

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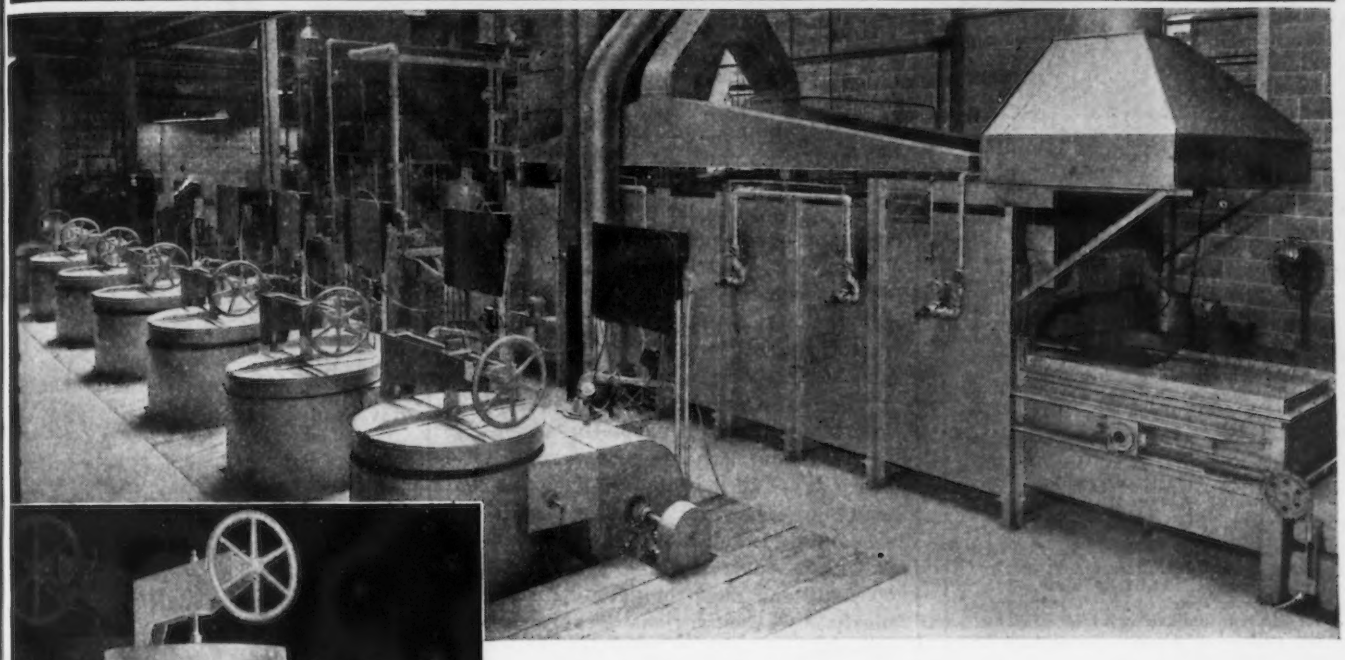
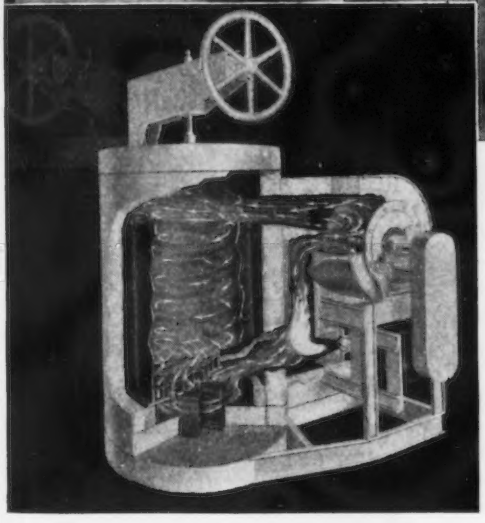
No. 50 OF A SERIES of Typical Installations





The above cut-away view shows operation of the Standard Stewart Basket Type Recirculating Air Draw Furnace. Note the unrestricted and uniform air flow recirculation to provide thorough, even heat distribution throughout the load. Ample fan capacity and powerful fan motors assure maximum uniformity and production. The flexibility and wide temperature range are two basic reasons why Stewart Recirculating Furnaces are turning in such good performance records on a wide variety of jobs.

Installations like this, developed by STEWART, for war production, can help you meet your peacetime needs.

The above installation is typical of many STEWART wartime installations that are well suited, because of versatility and wide heat treating range, to peacetime operations.

The conveyor furnace on the right is designed to heat for hardening with automatic conveyor quench, but is also adaptable to normalizing, annealing or similar operations in the temperature range of 1350° to 1600° F. With this versatility all ordinary heat treating operations for small forgings, tools, machine parts, etc., can be carried out with minimum manpower, fully controlled as to temperature and cycle.

The Basket type recirculating furnaces shown on the left permit segregation of products for varied tempering cycles. Drop forgings, die castings, sand castings, stampings, or anything else small enough to be most conveniently handled in batches, can be heated quickly and uniformly in this furnace. The ease with which a whole basket load can be placed in or removed from the heating chamber gives these furnaces a great daily output. For example, a furnace with a 30 inch diameter by 36 inches deep basket can turn out over 20,000 lbs. of steel per day.

A letter, wire or 'phone call will promptly bring you information and details on standard or special Stewart furnaces suitable for your requirements. Or, if you prefer, a Stewart engineer will be glad to call and discuss your heat treating problems with you.

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- records, files and indexes, storeskeeping, routing of work, coordinating slow and fast work, special systems of production control for different kinds of industries, shipping, departmental problems, estimating, planning, cost control —
- the selection and training of personnel, merit rating, evaluation and classification of jobs, compensation schedules, delegation of authority, health and safety of personnel, motion and time studies, avoidance of friction and overlapping of work.

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Treasury Procurement Plan

(CONTINUED FROM PAGE 91)

drawn up, printed, and sent to government purchasing agents throughout the country. Treasury Procurement's only function from this point on is to see that the terms of the contract are carried out and to renew the contracts as they expire.

In actual operation, if a government department in one of the states needs a quantity of wrenches the purchasing agent will consult General Schedule 41, Hand Tools. Here he will find the type of wrench, the manufacturer he must buy from, unless the item is stocked by Procurement, the unit cost, delivery time and all other needed information. Specifications are also listed. The contractor is assured of all government business for the item for the period of the contract, since use of the general schedules is mandatory.

There are more than 1800 different items required to conduct the administrative functions of the government every day, and it is these items which make up the bulk of the general schedules. In addition, there are Procurement contracts for more than 500,000 items used regularly or irregularly by the various government agencies.

To bid on general schedule items a manufacturer writes to the Contract and Purchase Branch of Treasury Procurement in Washington and indicates that he would like to bid on government business. He is then sent a questionnaire and if he fills the qualifications he is placed on the mailing list for that schedule. When the time comes to fill that schedule he is sent an invitation to bid, which gives full details of the government's requirements. These are usually required to be returned within 10 days.

The bids remain sealed until the date previously furnished the manufacturer. They are then opened in a public bidding room; bidders are invited to attend and the bids are opened and listed in full view of everyone attending. The purchasing officer is required to accept the lowest responsible bid, and in the case of firms who have been doing business with Procurement they may be accepted on the spot. In most cases final acceptance requires several days. The government asks for discounts on 12, 20 and 30-day payment, although this is not mandatory.

After initial shipments are inspected and tested orders begin to come from various agencies, using

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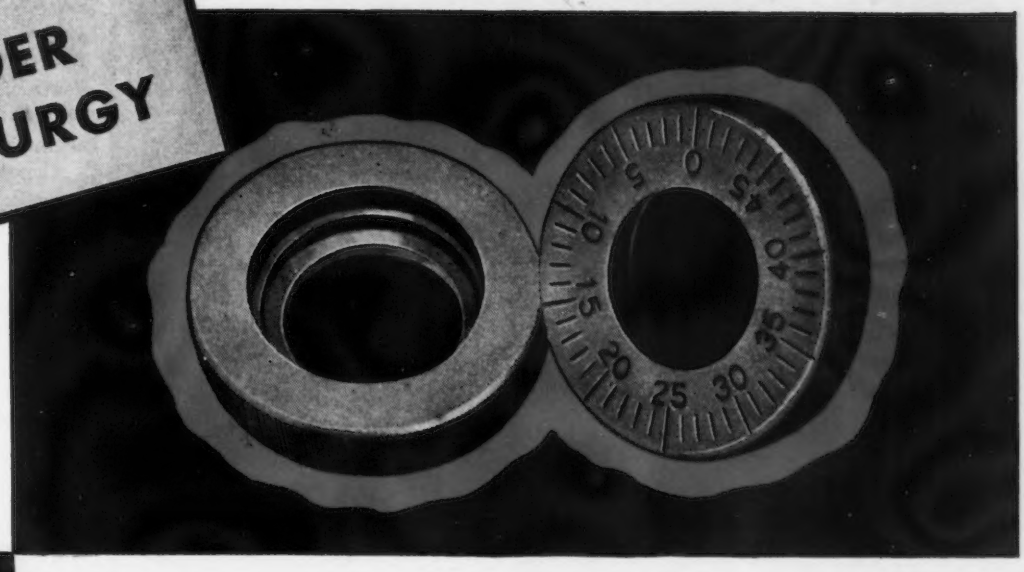

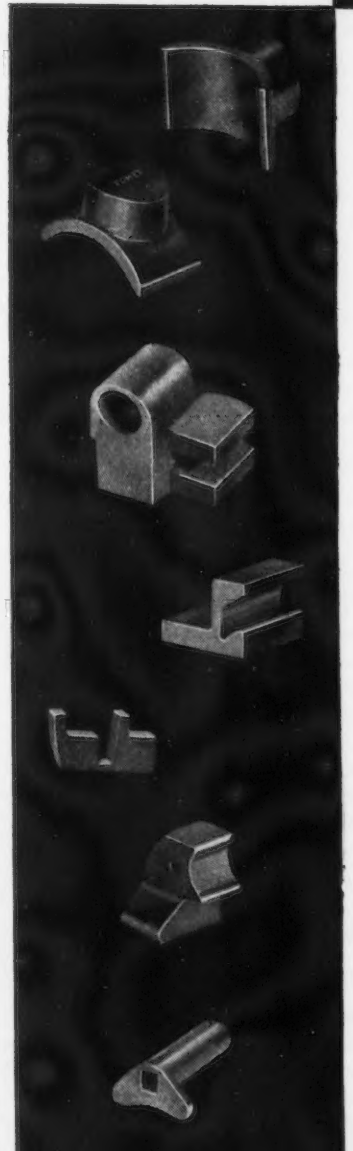

DON'T DECIDE UNTIL YOU SEE WHAT POMET CAN DO

MORE · MORE · MORE

FOR LESS MONEY—AND *Quicker*

All over the nation production has been stepped up. Never has the tempo been so fast.

Here in the Pomet plant we are employing the latest techniques in powder metallurgy to help manufacturers meet the need for speed and economy.

In the volume production of small precision parts Pomet methods have been particularly outstanding. Pomet parts can be held to tolerances of plus or minus .001" or better, with all or most of the need for expensive machining eliminated.

Precise dimensional accuracy can be combined with high technical density in the manufacture of parts like gears, pole pieces, intricate machined parts and front sights or triggers for guns.

Research and shop experience, dating back to the early days of powder metallurgy, enable us to produce Pomet parts that have ductility, wear resistance or hardness to a degree hitherto unknown in the art of compacting metal powders.

Metal powders with widely differing characteristics can be homogeneously combined to form alloys of the highest purity—alloys that offer interesting properties.

These are just a few of the many ways in which Pomet can help you effect substantial savings in time, material and labor in quantity production. It might pay you to investigate the possibilities of Pomet powder metallurgy either for war production or as a definite aid in helping you place your post-war products on the market sooner and with reduced costs.

In quantities of 20,000 and over, Pomet parts are especially interesting to manufacturers who have to keep cost in line with rigid specifications. New and enlarged plant facilities enable us to offer you exceptional service. Send for interesting and informative literature.

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This 10-second test will quickly show you why a flexible coupling is mighty important to the life of direct-connected machines.

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Ajax Flexible Couplings provide a positive but resilient connection between driving and driven shafts. They make it possible for each shaft to rotate around its own axis without creating vibration, chatter, strain on bearings, drag, power loss, reversal of torque and other detrimental features.

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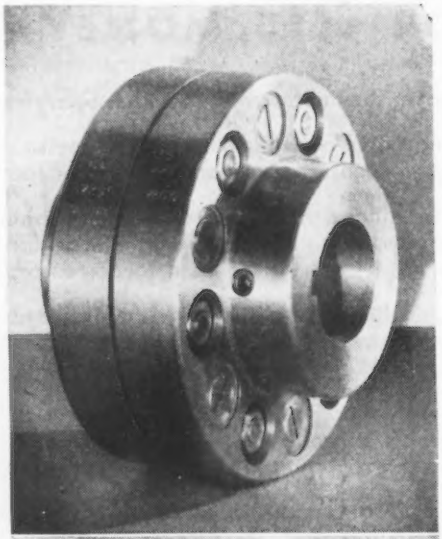
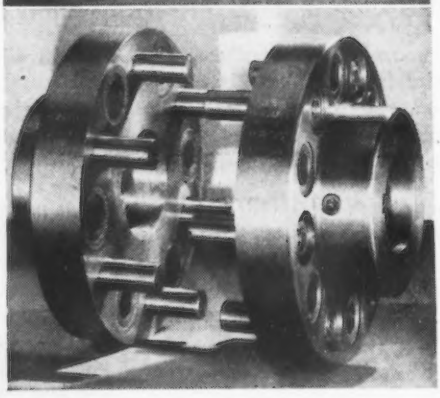




ARMY E NAVY

AJAX Flexible Coupling Co.
Incorporated 1920 WESTFIELD, N.Y.

their own funds. The contractor has already been informed as to what constitutes an authorized order. In 10 years of prewar purchasing more than $1,000,000,000 has been spent on general schedule business.

There is also a system of open market bidding to care for items not included in the general schedules. Open market operations account for orders of special items which are not regularly used by the government. The bidding procedure is the same as that for general schedule items, except that a definite amount is contracted for. In this operation all orders which come from the bills go to Treasury Procurement.

In normal times if a manufacturer listed with Procurement is sent three invitations to bid and no reply is received he is then removed from the list. There are 27,000 manufacturers on the lists, but there is room for many more. The last business census lists more than 184,000 manufacturers. The Procurement Division welcomes more bidders, since competition tends to reduce cost to the government.

Dropped for the duration is the requirement calling for the posting of a sum of money, generally a percentage of the contract, or a bonding to insure the carrying out of the terms of the contract. The money when deposited is returned after fulfillment of the contract.

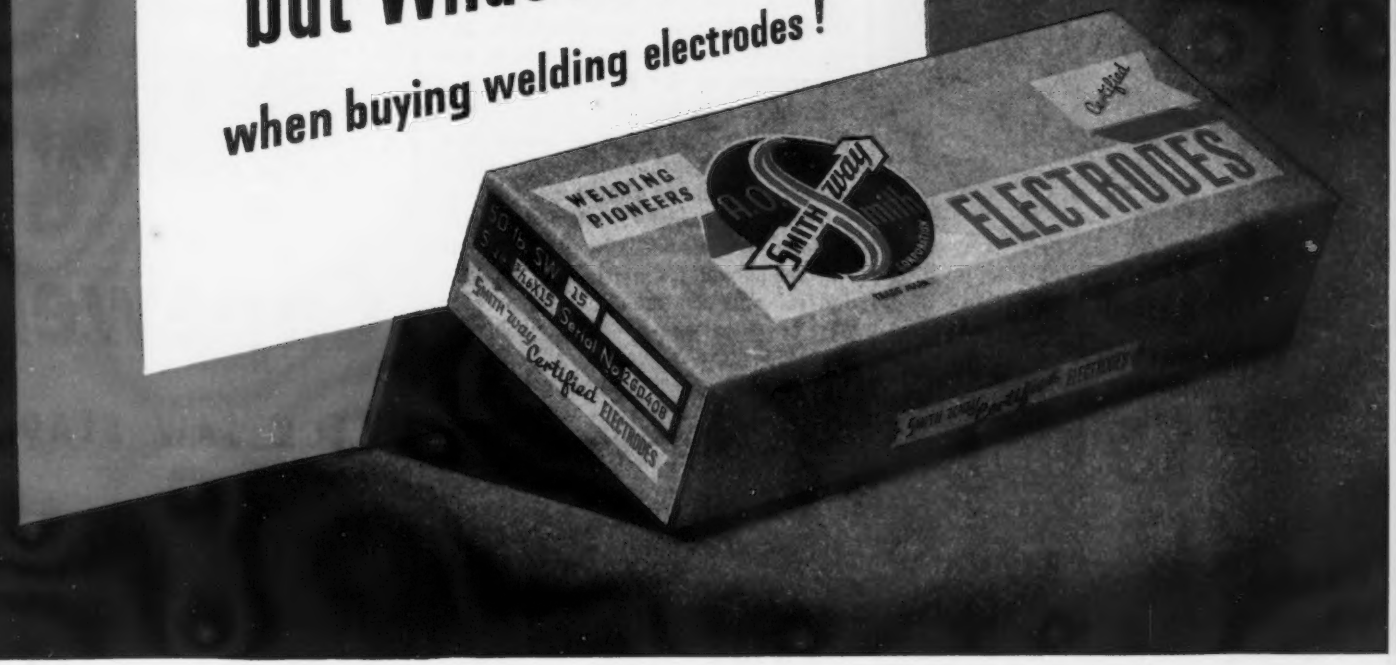
The postwar world is likely to bring many changes in the Procurement Division's purchasing operations. One of these, which is being carried out at present, will permit the 11 regional procurement officers to carry on open market operations to supply government establishments in their respective regions.

Another change that is being discussed is the scrapping of the present system of open competitive bidding in favor of negotiated bidding instituted as an emergency war measure. Procurement officials say this would result in a saving in paper work, a reduction in personnel, reduction in price to the government, since open competitive bidding in most cases brings the current market price, even though some manufacturers would be willing to submit lower estimates and lastly it would put government on the same basis as industrial purchasing. This change would require legislation, since present law requires peacetime contracts to be awarded to the lowest responsible bidder, after open competitive bidding.

Material contracted for by the government is in most cases subject to

Not What You Pay but What You GET

when buying welding electrodes!



☆ *IF* all welding electrodes of the same type were exactly alike, or even very similar, there would be no question as to which to buy.

But welding electrodes are *not* alike. They are not even "very similar." We know this to be a fact, for we spent several hundred thousand dollars to discover it. Our laboratory and shop tests reveal with definite finality that the price per pound of electrodes does *not* determine the *material* or the *time cost* of welding. Both of those figures are governed by what you *get* from electrodes — not what you pay per pound.

With us, welding electrodes are *production tools*. We manufacture the SMITHway Certified Welding Electrodes used in our plants in order to assure the quality, the uniformity, and the characteristics essential to more *good* welds per man-hour. We offer others who do welding the same electrodes.

If you feel that there is little if any difference in welding electrodes, we think we can *prove* that the price you pay for SMITHway Certified Welding Electrodes *buys* considerably *lower welding cost* — and considerably *better welding results*.

Mild Steel . . . High Tensile . . . and Stainless Steel

WELDING ELECTRODES

Made by welders . . . for welders

SMITHway Welding Monitor: *cuts time cost of training welders as much as 33⅓% by automatically signaling operator when correct feeding speed is or is not being maintained.*

SMITHway AC Welding Machine: *no arc blow; reduces spatter losses; effects worthwhile overall power saving; gives more good welds per man-hour.*

A.O. SMITH *Corporation*

MILWAUKEE • WISCONSIN ★ HOUSTON • TEXAS

PUNCH-LOK
Streamlined
HOSE BANDING METHOD

SPEED-SAFETY-ECONOMY
In Clamping-Splicing-Repairing-Mending-Tieing-Reinforcing

PUNCH-LOK Streamlined Hose Banding Method is being used in hundreds of production and maintenance jobs in all industries for connecting high-pressure hose; splicing electric cable; stopping leaks in steam and water lines; reinforcing and mending splits in crossarms and ladder rails; tieing rigid conduit or flexible cable to existing pipe lines or girders; tieing ends of wire or manila rope to prevent fraying—and many other jobs. PUNCH-LOK is giving wartime industries a fast, safe, economical, quality banding method. Investigate NOW the many advantages it will have for you in your present and postwar work. Let PUNCH-LOK solve your clamping or banding problems!

CLAMPS . . . Made of flat, high tensile, galvanized steel, double wrapped. Available from ⅜" to 48" I.D. Any large size clamp can be pulled down and made into a smaller size.

LOKING TOOL . . . Sturdily constructed to assure long life. Locks all size clamps with a tensional pull of 1,000 lbs. Hammer punches and breaks excess band flush at clip.

GROOVED FITTINGS . . . For water or steam lines. Permits application of high pressure clamping without damage to hose.

Write for Descriptive Catalog and Name of Local Distributor

PUNCH-LOK COMPANY
Dept. K, 321 N. Justine St.
Chicago 7, Illinois

rigid specifications, which must be adhered to by the contractor. The Procurement Division is empowered to set up specifications in cases, where they do not exist and to revise specifications when the need arises. At present there are three types of specifications—federal specifications, Procurement Division specifications, and specifications which are unique to one department of the government.

Federal specifications are developed by 72 inter-departmental committees comprised of technical men familiar with the products that concern their particular committee. All new specifications are devised by these committees as well as revisions in existing federal specifications. The need for new specifications develops when new techniques are brought out by industry, or when the requirements of the government change. When the new specification is computed it is presented to the director of the Procurement Division for approval, then to the heads of all departments for further approval. If no objection is encountered it then stands as a Federal Specification and becomes mandatory for use in government purchasing.

Procurement Division specifications are set up entirely within the division, and all government agencies are notified of the existence of these specifications. They are set up mainly in cases where Treasury Procurement, through its large purchases, is the dominant government purchaser for that particular item. This includes a great many of the 1800 items required for administrative operations in the government.

Specifications unique to one department are developed by that department and in practically all cases are used by that department only. All specifications are constantly checked and reviewed to keep in step with technological advances. At present there are more than 1700 federal specifications, 400 procurement division specifications, and some 500 emergency alternate specifications, introduced as a wartime necessity. It is expected that some emergency specifications will be carried over into postwar government purchasing, since in a number of cases substitute materials have proved better than the original materials.

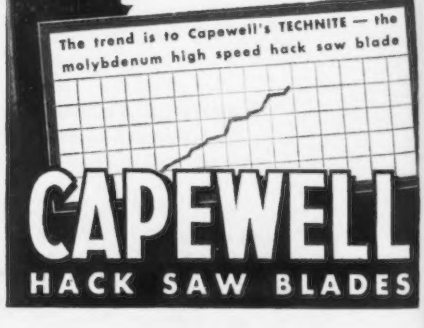
A manufacturer can determine what the government specifications are for the products he makes before he decided that he would like to do business with the government by obtaining the federal specifications for his products from the government printing office

Capewell
HACK SAW BLADES
Licked the Job

Cast iron pistons covered with $\frac{1}{16}$" of stainless steel "were some babies to saw". The operation bothered production. Then the manufacturer tested Capewell's *Technite* hack saw blades. Sawing is no longer a bottleneck.

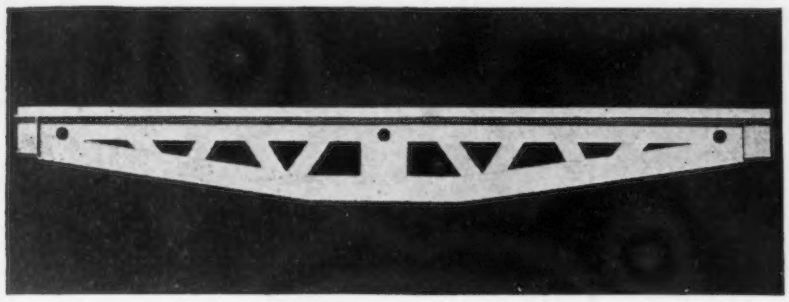
Have you a similar problem? A tough one? Have you investigated Capewell hack saw blades?

THE CAPEWELL MFG. CO.
Hartford, 2, Conn.



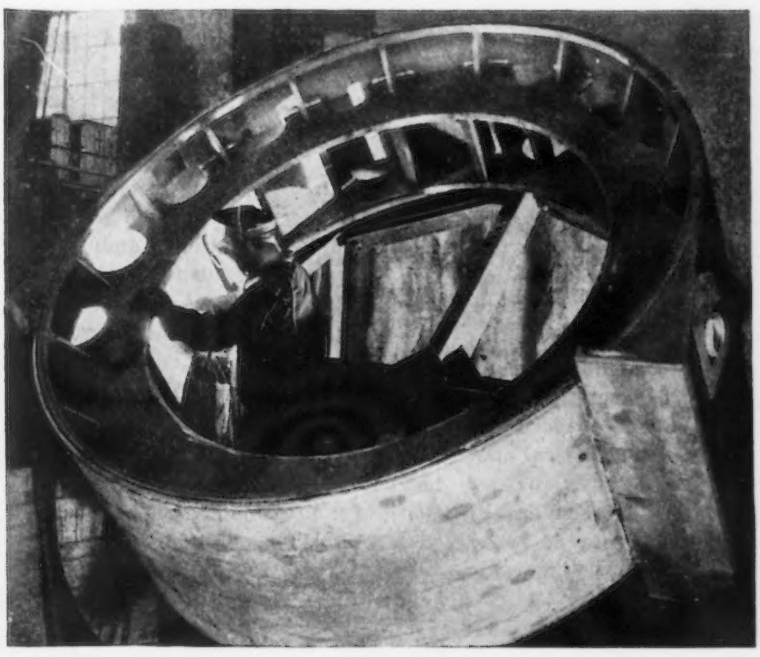
ARC WELDING HIGHLIGHTS

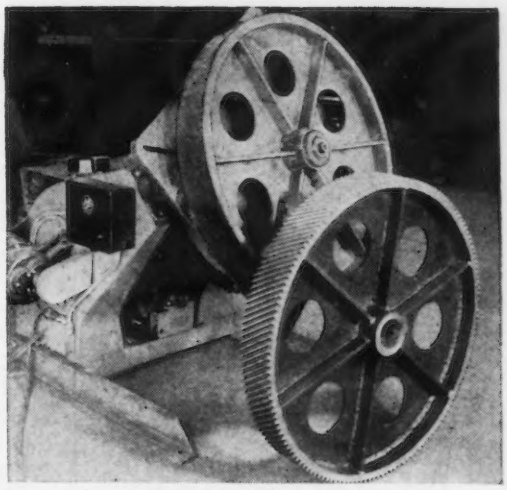
BETTER DELIVERIES of electrodes are the order of the day, thanks to the current higher output of manufacturers, and to the curtailment of certain parts of the war production program. The latest production figures reveal that almost 65% more mild steel, coated electrodes were produced in the first eleven months of 1943 than in the corresponding period the previous year. Deliveries now generally may be made in weeks instead of months; and certain types of electrodes can be shipped immediately. *However, fabricators should continue to order as far ahead as possible, as this enables electrode manufacturers to anticipate and meet the specific demands for various types.*



HATCH SHIFTING BEAM saves ten tons of steel per ship. Twenty feet long, weighing 1,125 pounds, these beams are produced in quantity by the Globe Company of Chicago. Welding is done in ten specially designed fixtures, each of which aligns and holds parts in position as they are welded. Quarter-inch reverse polarity rods are used for welding the lacings and gussets and $\frac{7}{32}$" Murex Type FHP for the intermittent fillet welds that attach the long plate to the top of each beam.

THE ELECTRIC MACHINERY MANUFACTURING COMPANY of Minneapolis, a leading designer and manufacturer of synchronous motors, reports that arc welding has taken the place of cast construction in pedestal bearings, stator frames, and bases. Welding approximately halves weight; produces greater rigidity and sturdiness; permits variations of design at small cost. Overall savings are estimated at more than 30%.





ARC WELDING IS A 50% TIME-SAVER as compared with casting in the fabrication of heavy gear blanks, according to the Ransome Concrete Machinery Company, Dunellen, New Jersey. Murex Types F and FHP "hot" rods used at high currents permit rapid deposition of weld metal and result in smooth, uniform welds of great strength.

SPHERICAL ANTI-SUBMARINE NET FLOATS by the thousands are built by Brown Steel Tank Co., Minneapolis. Each float is fabricated from six segments of 3/16 inch steel plate. Positioners are used. Welds are made from the outside, using $\frac{1}{4}$" Murex Fillex electrodes. These floats withstand salt water submergence tests to a depth of 250 feet.

MUREX

ARC WELDING ELECTRODES

•

METAL & THERMIT CORPORATION

120 Broadway, New York 5, N. Y.

ALBANY • CHICAGO • PITTSBURGH

SOUTH SAN FRANCISCO • TORONTO

Specialists in welding for nearly forty years. Manufacturers of Murex Electrodes for arc welding, and of Thermit for repair and fabrication of heavy parts.

FREE!

THIS 24" x 32" WALL CHART GIVES ROCKWELL, BRINELL, SCLERO, VICKERS HARDNESS AND TENSILE STRENGTH CONVERSIONS

• If you are a production executive whose responsibility includes the hardness testing of metals, you will certainly want one of these new charts for your office, shop, or laboratory. Handsome in appearance, printed in three colors, with the very minimum of advertising, it will prove its value every hour of every day. Type is large, easily read at a distance of several feet, yet the chart itself is only 24" wide and 32" high—about the size of a calendar.

Although a chart like this is relatively expensive to produce, and the quantity is rigidly limited, a copy is yours—free for the asking—if you request it on your letterhead.

Write Dept. IA, CLARK INSTRUMENT, INC., 10200 Ford Road, Dearborn, Michigan.

CLARK

TOMORROW'S ACCURACY TODAY

CLARK

HARDNESS TESTER FOR "ROCKWELL" TESTING

for the nominal cost of 5c each. All federal specifications are available from GPO with a few costing several cents more than the average price previously mentioned.

The Procurement division carries on extensive testing and inspection procedures to see that the contractor abides by specifications. Items selected at random from shipments are subjected to visual and physical examination in the division's well-equipped laboratory. Officials say that there have been no cases of wilful attempts to defraud the government uncovered in Procurement operations.

Traffic control is an integral part of the division's work. This work covers consignment of material, designation as to where, when, and how material is to be shipped, always endeavoring to ship at the cheapest possible rate. Packing and packaging regulations are also prescribed by Treasury Procurement.

For the government establishments in the District of Columbia area all needed supplies are stocked by the Treasury Procurement warehouse and distributed to the various departments on a retail sales basis. Procurement charges 5 per cent for this service. This money goes into a revolving fund of $5,000,000 originally set up by law. Enough money is made out of this 5 per cent surcharge to employ warehouse personnel and make administration of government procurement in the District of Columbia for regular supplies a self-sustaining operation.

On open market purchasing there is a 2 per cent surcharge, with a maximum of $100 on any one purchase. On general schedule purchases there is no charge, since the departments buy from the schedules, using their own funds.

Treasury Procurement also maintains and equips the central heating plant of the government and buys all necessary supplies, as well as a garage operating a large number of government vehicles, and complete automotive and repair facilities.

The war work of the Procurement Division began in 1939 when the Army Navy Munitions Board decided to stockpile 29 strategic and critical materials, 10 of which the division was called upon to supply. These materials include chrome ore, ferrograde manganese, mercury, mica, quartz crystal, tin and industrial diamonds.

The amount of money expended on these materials to the present time is not available, nor is the amount of material obtained, since this is the only Treasury Procurement program which comes under the heading of military secrecy. The last figure released was in May, 1943, at which time $50,000,000 had been spent on this program, which is still going on.

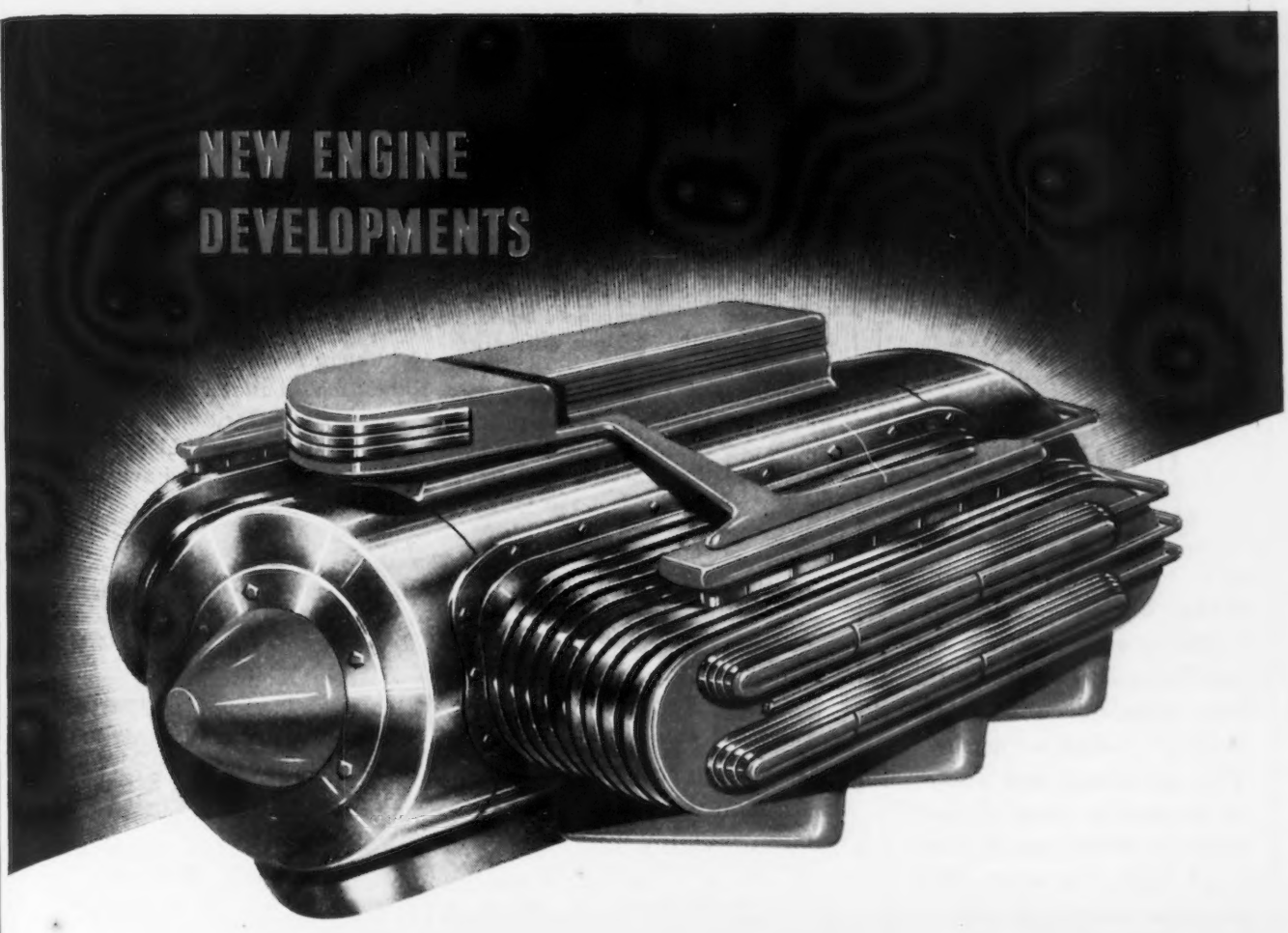
With the beginning of Lend-Lease Procurement was given another huge buying task. Under the Lend-Lease Act the Army and Navy were to procure weapons of war, the Maritime Commission was to buy ships and maritime equipment, food was to be bought by the Department of Agriculture, and all other goods were left to Treasury Procurement. This included industrial equipment, entire plants, metals, lumber, motor vehicles, chemicals, hand and machine tools and a whole host of material.

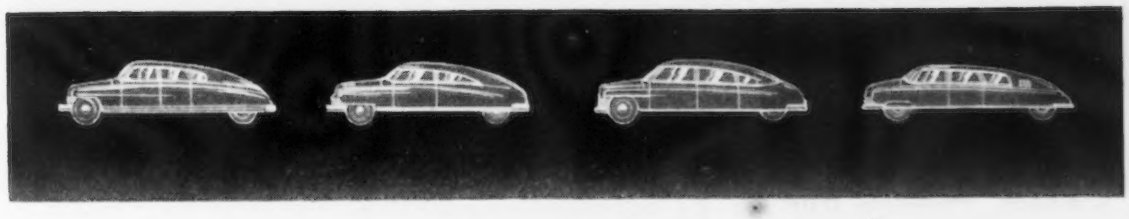
Treasury Procurement buying for lend-lease is negotiated rather than under the system of open competitive bids, as the paramount question in this case is expediency of delivery. However, in most cases more than one contractor is approached.

More than 50,000 lend-lease contracts have been let by Procurement, covering more than 800,000 different items. Lend-lease buying is now estimated to run about $3,000,000,000 annually. Standard specifications are used for lend-lease orders where they exist, and in many cases, particularly foreign items, new specifications are supplied the contractor. Among items purchased for lend-lease disposal are steel ingots, bars, sheets, plates, etc., tools, trucks, nuts and bolts, bearings, locomotives, power plants, tire factories, razor blades, printed railroad tickets and false teeth.

Procurement Division buying for relief work is just beginning, and while not large at present, the number of contracts is increasing from day to day. At present, the United Nations Relief and Rehabilitation Administration makes its requisitions through the Foreign Economic Administration, who in turn orders goods through Treasury Procurement using Lend-Lease funds. Treasury Procurement is now the sole buyer for UNRRA.

One of the UNRRA projects being handled by Procurement is the purchase of approximately 500,000 pieces of farm machinery and repair parts reported in THE IRON AGE of March 16, page 102. Purchasing for UNRRA is done on a competitive bid basis.





SOME DAY after the war, automotive and aircraft developments will probably startle the industrial world. Who knows? Today's modern aircraft was hardly on paper at the start of the present war. One of the basic changes in the automotive field will be the wider use of light alloys. Through new engine designs, increased horsepower output per pound of engine weight will be developed. The Bohn organization is one of the pioneers of light alloy parts for automobile engines. When you are ready to talk light alloys as applied to advanced engine designs, this is the place to come.

BOHN

BOHN ALUMINUM AND BRASS CORPORATION

GENERAL OFFICES—LAFAYETTE BUILDING • DETROIT, MICHIGAN

Designers and Fabricators

ALUMINUM • MAGNESIUM • BRASS • AIRCRAFT-TYPE BEARINGS

the tie that doesn't bind

● The bit of elastic that holds up your stocking has one thing in common with this annular coil spring. Both are called a "garter". This particular one comes in diameters from a half inch up. Widely used to expand leather washers they are also combined with a carbon or graphite ring to minimize steam leakage in turbines.

Springs of this type must be extremely flexible and resilient. Pressures must be uniform yet soft enough to prevent binding. If our experience can help you—

Write, wire or, for extra speed, phone—

Holly 2211 or call Detroit, Cherry 4419

AMERICAN SPRING OF HOLLY, INC.
HOLLY, MICHIGAN

Maritime Commission Praises Small Plant Assistance in Ship Output

• • • **Hundreds of small manufacturing concerns are playing an important role in getting American merchant ships delivered on schedule, the Maritime Commission announced March 14.**

During 1943, 50.2 per cent of the contracts over $10,000 awarded by the Commission's Procurement Division went to plants hiring fewer than 500 employees. These small concerns scattered throughout the United States received 2452 of the 4881 construction material contracts let during the year. Sixty of the 128 manufacturing plants that have won the Maritime "M" award are small concerns with less than 500 employees.

The following list shows some of the small businesses that have received the Maritime Commission's "M" award, number of employees, and products manufactured for the merchant ship program:

Name	Number Employed	Product
The Air Preheater Corp. Wellsville, N. Y.	250	Boiler casings, jigs and fixtures
Baltimore Copper Paint Co. Baltimore	340	Marine paints
Beaumont Iron Works Co. Beaumont, Texas	324	Castings
The Bevis Machine Co. Middletown, Ohio	68	Steel wrenches, forgings, propulsion shafting
Buckeye Iron & Brass Works Dayton, Ohio	250	Pump relief valves, switch valves
R. D. Cole Mfg. Co. Newman, Ga.	307	King posts and masts
The Colonial Foundry Co. Louisville, Ohio	150	Castings, machine tools, bedplates
Colvin-Slocum Boats, Inc. Amesbury, Mass.	230	Life rafts, life preservers, life preserver jackets, life preserver material
The Combustion Engine Co., Inc. St. Louis	397	Drums for ships boilers
Condenser Service & Engine Co., Inc. Hoboken, N. J.	426	Main condensers
C. Lee Cook Mfg. Co. Louisville, Ky.	240	Packings for diesel engines
Curtis Lighting, Inc. Chicago	227	Searchlights, cargo lights and floodlights
Davis Engineering Corp. Elizabeth, N. J.	214	Coolers
Dri-Steam Products Co., Inc. New York	21	Separators
Eastern Cold Storage Insulation Co. New York	133	Insulation for ships' stores
The Edward Valve & Mfg. Co. East Chicago, Ind.	360	Valves
Enterprise Wheel & Car Corp. Bristol, Tenn.-Va.	350	Castings
Filer & Stowell Co. Milwaukee	450	Engines
Foran Foundry & Mfg. Co. Flemington, N. J.	165	Machine tool castings, water condenser box castings
Globe American Corp. Kokomo, Ind.	400	Metal lifeboats
Goldens' Foundry & Machine Co. Columbus, Ga.	275	Steering engines
Graham Mfg. Co., Inc. New York	101	Condensers, air ejectors, allied heat exchanger equipment
Hesse-Ersted Iron Works Portland, Ore.	315	Winches and windlasses
Homestead Valve Mfg. Co., Inc. Coraopolis, Pa.	307	Valves
Kerotest Mfg. Co. Pittsburgh	2440	Valves
Koppers Co. Baltimore	260	Propellers
Lake Shore Engine Co. Iron Mountain, Mich.	299	Cargo winches
Lewis Bolt & Nut Co. Minneapolis	350	Special bolts and nuts
Los Angeles Steel Casting Co. Los Angeles, Cal.	491	Fittings and valves
John Lucas & Co., Inc. Gibbsboro, N. J.	251	Insulation for ships stores
Martin-Parry Corp. York, Pa.	362	Joiner work
Mercer Tube & Mfg. Co. Sharon, Pa.	277	Steel pipe
Monarch Forge & Machine Works Portland, Ore.	209	Assemblies (reverse shaft, etc.)
William T. Morris Long Island, N. Y.	1	Steering wheel spokes

(Continued on page 116)

9 Items to Check When Ordering Wire Rope

(Note: Every day, several orders are received which require correspondence and delay because of insufficient information. Listed below are items which can be used as a wire rope specification check list. Because wire rope is a controlled material, CMP allocation or symbol, also certification, must be included before orders can be entered.)

WIRE ROPE CHECK LIST

Item	*Example*
1. Length	120 Feet
2. Diameter	¾ Inch
3. Number of Strands	6
4. Number of Wires per Strand	19
5. Lay	Right Lang Lay
6. Core	IWRC
7. Kind of Fabrication	PREformed
8. Grade	(Improved Plow Steel) Monarch Whyte Strand
9. Use	Make, Model of Equipment

(Plus . . . CMP allocation or symbol, also certification.)

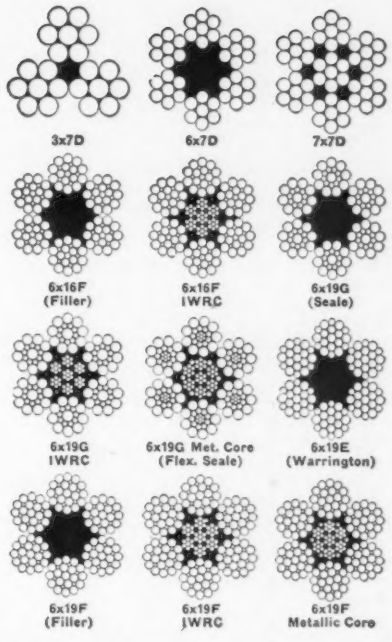
Here are all these items for this order. 120 feet ¾-inch 6 x 19 Right Lang Lay with IWRC PREformed Monarch Whyte Strand Wire Rope, to be used for hoist line on Model 45 Lorain Skimmer.

Note: For more complete detailed information on how to specify wire rope, refer to Macwhyte G-15 Wire Rope Catalog, pages 99 to 101.

The above check list is normal and complete as to the specifying of wire rope in peacetime, but it is more important than ever in wartime when it is so difficult to get wire rope.

STATE USE FOR ROPE—IT HELPS

Always include the type of service for which the rope is wanted. Then if an error is made in listing the proper construction, or if our experience has shown a different construction gives better service for this purpose, we may be able to help you obtain a better rope. In some cases such information today, makes possible your getting a wire rope to meet your needs when the rope you specify is not available but a similar one is available that might do an even better job for you at no additional cost.



These are but a few wire rope constructions taken from our G-15 Wire Rope Catalog to indicate the vast number of types and constructions of wire rope that are made. As wire rope manufacturers, we are in a position to help wire rope users obtain the correct rope for their specific needs.

HOW TO MAKE SURE OF CORRECT ROPE FOR YOUR EQUIPMENT

There are hundreds of different sizes, grades, and constructions of wire rope. For many years we have cooperated with wire rope users to get the correct ropes for all kinds of equipment. We have watched these ropes give outstanding service on equipment like yours.

The benefit of that experience may help make your wire ropes last longer, or may help you in specifying what we believe is the finest wire rope you can buy — the *correct* rope for *your* equipment: Monarch Whyte Strand PREformed.

Monarch Whyte Strand PREformed has recorded outstanding service records because:

It's made from selected steels.

It's PREformed to reduce internal stresses and to fight rope fatigue.

It's internally lubricated to protect wires and strands against corrosion and friction.

MACWHYTE
PREformed
WIRE ROPE
***Plus* Internal Lubrication**
Selected Steels
Tested—Proved
The correct rope for your equipment

NO. 706

MACWHYTE COMPANY

ARMY E NAVY

WIRE ROPE MANUFACTURERS

The correct rope for your equipment

2911 Fourteenth Avenue, Kenosha, Wisconsin

Mill Depots: New York · Pittsburgh · Chicago · Fort Worth · Portland · Seattle · San Francisco. Distributors throughout the U.S.A.

MACWHYTE PREformed and Internally Lubricated Wire Rope · MONARCH WHYTE STRAND Wire Rope · MACWHYTE Special Traction Elevator Rope · MACWHYTE Stainless Steel Wire Rope · MACWHYTE Braided Wire Rope Slings · MACWHYTE Aircraft Cables and Tie-Rods · MACWHYTE Monel Metal Wire Rope

STRENES METAL
IN FRONT LINE OF SERVICE

BEFORE THE WAR

Strenes can be cast to shape. Most of the usual machining time is saved. Redressing is reduced. That is why before the war Strenes gained heavily as forming and drawing die metal. In one case around 2,000,000 stampings were obtained and the die is still in good condition, ready to resume operation at the end of the war. Runs of 100,000 pieces up are not uncommon. Hundreds of the largest plants in the country used it regularly in their tooling programs. Want the names of pre-war users of Strenes?

IN THE WAR

Strenes today is being used for draw pots, draw pot inserts, draw rings for draw bench operation, for progressing upsetting dies—all in shell manufacture. Glad to identify all such users and many others.

AFTER THE WAR

After the war, refrigerator, stove, metal casket, grave vault, farm implement and other manufacturers will resume with Strenes metal forming and drawing dies. Many of the automobile, truck and tractor builders are extensive users, for body, fender and hood dies. Will name them to interested inquirers.

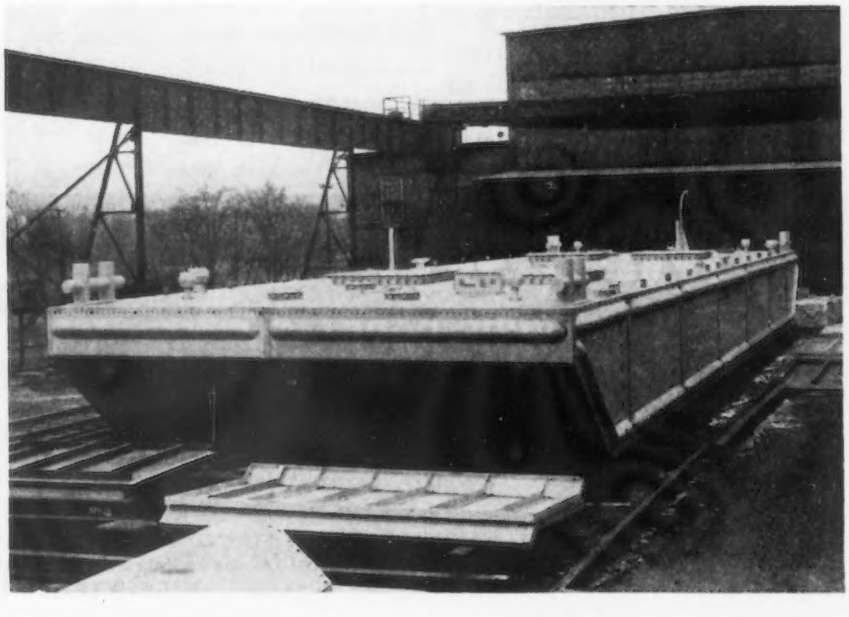
Look into the merits of Strenes metal — Try it, at least once.

THE ADVANCE FOUNDRY CO.
DAYTON 3, OHIO

(*Continued from page* 114)

Name	Number Employed	Product
National Tile & Marble Corp. New York	150	Deck covering
Oil Well Supply Co. Oswego, N. Y.	170	Auxiliary condensers
Paxton-Mitchell Co. Omaha	375	Metallic packing
Pennsylvania Range Boiler Co. Philadelphia	175	Fabrication of inspection tanks
Pottsville Castings & Machine Shops, Inc. Pottsville, Pa.	407	Water boxes, bonnets and covers for main and auxiliary condensers and castings
E. H. Scott Radio Laboratories, Inc. Chicago	370	Radio equipment
Scott Graff Co Duluth	149	Knocked-down non-propelled barges
Security Engine Co., Inc. Whittier, Cal.	317	Steel valves and fittings
Selby, Battersby & Co. Philadelphia	418	Reciprocating pumps
Socony Paint Products New York	176	Specification paints
The Stearnes Co. Chicago	103	Galley equipment
Sterling Steel Foundry Co. Braddock, Pa.	300	Steel castings
Stetson-Ross Machine Co. Seattle	264	Steering gears and hydraulic pumps
Sumner Iron Works Everett, Wash.	302	Winches and windlasses
L. Theiss & Sons Corp. Maspeth, N. Y.	20	Electrical equipment, rigging fittings, steel fabric and brass indicators
Trill Indicator Co. Pittsburgh	34	Precision instruments
The Turl Iron & Car Co., Inc. Newburgh, N. Y.	150	Evaporators, feedwater heaters, condensers
Watkins, Inc. Wichita, Kan.	250	Boiler casings, fabrication of parts
Webster-Brinkley Co. Seattle	312	Reciprocating engines for Liberties
Kelvin & Wilfrid O. White Co. Boston	100	Compasses and binnacles
The Wiches Boiler Co. Saginaw, Mich.	383	Boilers
Wilson-Snyder Mfg. Div. Braddock, Pa.	302	Reciprocating pumps
W-K-M Co., Inc. Houston	251	Valves
Young Iron Works Seattle	95	Timken roller bearing blocks

KNOCK-DOWN BARGES: *This is one of the* 198 *barges built for the Army by Bethlehem Steel Co., designed for carrying gasoline and dry cargoes. They can be knocked down and assembled on the field. Each barge is made up of* 123 *panels, and is* 104 *x* 20 *ft., with a depth of* 8 *ft.*



. . . there are NOW

ALLOYING MATERIALS ENOUGH

for all needs

SHORTAGES of important metallurgical materials have now been either directly relieved or compensated by satisfactory alternatives.

item: TUNGSTEN. Except for a few quite special uses, restriction is off. New production, greater volume of imports, and resulting growth of stock piles have brought relief.

item: MOLYBDENUM. Crippling regulation is a thing of the past. Renewed availability of tungsten and other scarce materials, new Molybdenum production, and improved economy of alloying practice, have lessened the need of Government restriction.

item: BORON. The potency of Boron as an intensifier of the effects of other alloying materials, has been the subject of almost incredible revelations in recent months. Very minute additions can be substituted for considerable percentages of scarcer and more costly elements, with full maintenance of the hardenability and other essential properties of high-grade steels. In cast irons, the percentage of Boron addition runs higher but is still very low and the results are remarkable.

The problem of an economical and satisfactory form in which to introduce Boron is met by a special ferro-boron produced by the Molybdenum Corporation.

As to the availability or approved uses of Tungsten, Molybdenum, or Boron, correspondence is invited.

AMERICAN Production, American Distribution, American Control—Completely Integrated.

Offices: Pittsburgh, New York, Chicago, Detroit, Los Angeles, San Francisco, Seattle.

Sales Representatives: Edgar L. Fink, Detroit; H. C. Donaldson & Co., Los Angeles, San Francisco, Seattle.

MOLYBDENUM

CORPORATION OF AMERICA

MCA

GRANT BUILDING
PITTSBURGH, PA.

Blast Furnace Capacity and Production February, 1944
Source: American Iron and Steel Institute

	Number of Companies	Annual Capacity	PRODUCTION, Net Tons							
			PIG IRON		FERRO-MANGANESE AND SPIEGEL		TOTAL			
									Per Cent of Capacity	
			Current Month	Year to Date	Current Month	Year to Date	Current Month	Year to Date	Current Month	Year to Date
DISTRIBUTION BY DISTRICTS:										
Eastern	10	12,815,680	926,313	1,902,043	16,989	40,000	943,302	1,942,043	92.9	92.4
Pittsburgh-Youngstown	15	26,852,460	2,041,560	4,142,434	24,469	43,522	2,066,029	4,185,956	97.2	95.1
Cleveland-Detroit	7	6,620,500	494,844	1,014,830			494,844	1,014,830	94.4	93.5
Chicago	6	13,575,540	1,098,402	2,268,170		8,780	1,098,402	2,276,950	102.2	102.3
Southern	6	4,422,940	336,475	676,675	16,029	36,908	352,504	713,583	100.6	98.4
Western	4	2,372,900	127,932	263,164			127,932	263,164	68.1	67.7
TOTAL	34	66,660,020	5,025,526	10,267,316	57,487	129,210	5,083,013	10,396,526	96.3	95.1

Truman to Probe Advertising Costs

Milwaukee

• • • **Consideration** is being given by the Senate Committee to Investigate the War Program to advertising expenditures of war-created corporations, Senator Harry S. Truman told the Milwaukee Advertising Club here March 23.

Senator Truman pointed out that the cost of advertising is charged as an expense before profit, thus reducing the amount of profit on which federal income taxes are payable. Thus, he said, much advertising is indirectly paid for by the government.

He deemed this practice entirely proper on the part of corporations still producing civilian goods and obtaining little or no profit from sales of war goods to the government. He also said that firms which produced civilian articles before the war but which now have been wholly or in part converted to war production should be allowed to maintain a reasonable volume of advertising to be charged as an expense.

He placed in a third class "those corporations that had no extensive business before the war but which through the erection of huge plants at government expense and the addition of thousands of employees, now have extensive war contracts. Since these corporations have no established markets or products they must protect, any advertising which they may be permitted to charge as expense before taxes, is for the sole purpose of creating after war goodwill and markets and constitutes an additional gain or benefit from the war that could in some instances be of greater value than dollar profit."

He said, "I am of the opinion that some limitations could be put on the extent to which corporations of this third class may be allowed to charge advertising to cost before profit. I am also of the opinion that many of such corporations have already gone considerably farther than what might be considered reasonable limits."

Scullin Report Earnings Up

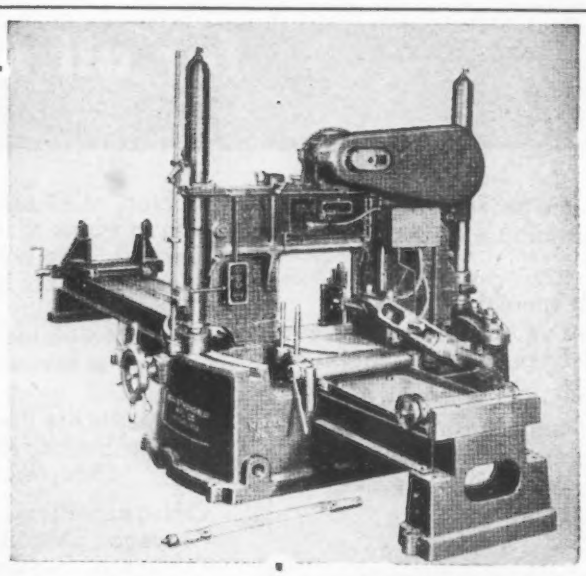
St. Louis

• • • **Scullin Steel** Co. reported for the year ended Dec. 31, 1943, a net income of $382,908, compared with $316,010 for the year ended Dec. 31, 1942. Net sales totaled $15,359,581 for 1943 against $10,737,032 in 1942.

CUTS the Toughest Steels and Largest Sizes *easily.*

This giant hydraulic metal-cutting saw is more than just a larger hack saw. It is a new development in metal-cutting methods that introduces a new principle of metal sawing — the Roll-stroke blade action makes it possible to cut the toughest steels in the largest sizes easily and rapidly. It also permits a simple and efficient, very low pressure Hydraulic Feed System.

Built for heavy work, completely enclosed in heavy housing, this machine will stand up under the rough usage of the average steel mill warehouse and forge shop, where it will speed cutting-off, and reduce material loss.



MARVEL No. 18
Giant Hydraulic Hack Saw
Capacity 18"x18"
Cuts angles up to 45° by simply swiveling upper machine housing.

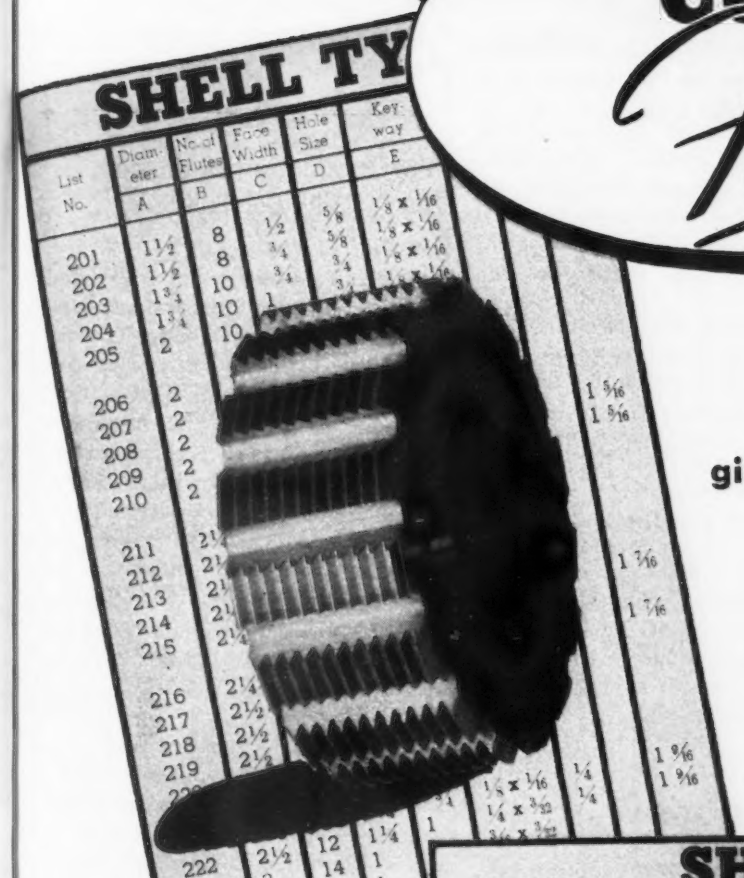
Write for Catalog

MARVEL SAWS

ARMSTRONG-BLUM MFG. CO.
"The Hack Saw People"
5700 Bloomingdale Ave., Chicago, U. S. A.

Eastern Sales Office
225 Lafayette St., New York

HOW TO GET THREAD MILLING CUTTERS *Faster*



SHELL TY

List No.	Diameter A	No. of Flutes B	Face Width C	Hole Size D	Keyway E
201	1½	8	½	⅝	⅛ x 1/16
202	1½	8	¾	⅝	⅛ x 1/16
203	1¾	10	¾	¾	⅛ x 1/16
204	1¾	10	1	¾	⅛ x 1/16
205	2	10			
206	2				
207	2				
208	2				
209	2				
210	2				
211	2¼				
212	2¼				
213	2¼				
214	2¼				
215	2¼				
216	2¼				
217	2½				
218	2½				
219	2½				
222	2½	12	1¼	1	¼ x 1/32
223	3	14	1	1	¼ x 3/32
224	3	14	1	1	
225	3				
226	3	14	1¼	1¼	
227	3	14	1¼	1¼	
228	3	14	1¼	1¼	
229	3	14	2	2	
230	3				
231	3	14	2	2	
232	3½	16			
233	3½	16			
234	3½	16			
235	3½				
236	3½	16			
237	3½	16			
238	3½	16			
239	3½	16			
240	3½	16			

1 5/16
1 5/16
1 7/16
1 7/16
1 9/16
1 9/16

SHANK TYPE

List No.	A Diameter Thread Section	B Number of Flutes	C Width of Face	D Length of Shank	E Length Overall	F Shank Diameter Large End	G Shank Taper: Jarno	G Shank Taper: Brown & Sharpe	G Shank Taper: Morse	H Drawbar Thread
101				3 11/16	5¼	.884	7	8	3	½-13NC
102						.922				⅝-24NF
103										½-13NC
104										½-13NC
105										⅝-24NF
106	1									½-13NC
107	1¼	8	1½	4⅛	6½					½-13NC
108	1¼	8	1½	4⅛	6½					⅝-24NF
109	1¼	8	1½	3⅛	5½	.948				½-13NC
110	1½	8	1½	4 11/16	6½	1.134	9	10	3	½-13NC
111	1½	8	1½	4⅞	6½	1.271				⅝-24NF
112	1½	8	1½	3⅛	5½	.948				½-13NC

Order by

STOCK BLANK NUMBER

giving Pitch and Thread Form desired

•

DETROIT

STANDARD STOCK BLANKS MEET 90% OF ALL THREAD MILLING CUTTER REQUIREMENTS

FOR STANDARD STOCK SIZES, ASK FOR BULLETIN No. CB-43

BUY U.S. BONDS STAMPS

DETROIT TAP & TOOL CO.

8432 BUTLER
DETROIT 11
MICH. U.S.A.

MACHINE TOOLS

. . . News and Market Activities

Machine Tool Builders to Press WPB for Permission to Reconvert

Cleveland

• • • **Pressure by** the machine tool industry on the WPB and the military authorities for earliest possible production of machine tools for reconversion of essential civilian industries can be expected to be increased, according to reports here. Many industries including many in the consumer durable goods classification now involved in war work but anticipating a demand for return to civilian production have machine tools on tentative order, for delivery when limitations are relaxed by WPB.

The machine tool industry, already suffering from lack of orders and facing a downward trend in new orders and shipments, can be expected to add its pressure to that of the other industries to try to force at least early production of the machinery which will be required for the reconversion so that this time lag may be avoided. The industry's attitude appears to sum up that the delay in conversion to war production for lack of tools need not be repeated in reconversion to civilian production. Likewise, the current availability of steel is a factor which tool builders can add to their score in favor of early tool building for conversion products.

Manpower, a sore subject in all industries, may not prove to be sufficient answer from WPB to quiet the demand as the industry asks only to be permitted to use those men that are left. By mid-year the present volume of sub-contracting now busying tool builders may free many workers who could be maintained on the labor force by a WPB grant to produce for consumer industries. Little except the chances of public morale effects appear to stand in the industry's way and action seems strongly indicated.

o o o

Meets to Ease Selling Restrictions

Cleveland

• • • **Members of a** sub-committee of the OPA advisory group representing the machine tool industry met at the Cleveland Hotel, Cleveland, today to discuss the industry's suggestions for changes in the regulation governing manufacturers' sales of machine tools and parts, OPA stated.

This meeting of the sub-committee followed a recent meeting of the entire industry committee with OPA officials in Washington, where a tentative revision of RPS No. 67 was submitted to the industry group for their criticism and suggestions. The revision would incorporate trade practices and terminology into the present regulation. No changes in present prices would result from the proposed changes, OPA said.

Another meeting of the entire committee is planned to be held in Washington during the week of April 10, 1944, at which time the suggestions from the industry committee will be presented to OPA.

The present regulation establishing ceiling prices for manufacturers of machine tools and parts was put into effect in January, 1942—with prices of October, 1941, as the base. That this regulation has been successful is indicated by Bureau of Labor Statistics figures showing that prices of machine tools and parts have remained unchanged at 118 per cent of the August, 1939, average since September, 1941.

•

Trecker Urges Tool Re-Distribution to School

Milwaukee

• • • **Re-distribution of basic** types of machine tools owned by the government among schools after the war and assignment of specialized tools for ordnance production to government arsenals was endorsed by Francis J. Trecker, secretary of Kearney & Trecker Corp., in a recent speech here. Such a course of action would maintain a nucleus of productive facilities for armament, provide a better industrial training for the nation's youth, and save the machine tool industry from the ruin which would be caused by dumping, Trecker said.

He declared that his own company had produced more machine tools in one year than it had in the previous 40.

•

War Production and Job Work Aid Tool Builders

Cincinnati

• • • **Expansion of** direct war production and job work in district machine tool plants tends to take up some of the slack in production schedules as result of the thinning backlogs. Current new business is insufficient to take care of the full production that has become habitual in this industry here, although manufacturers continue to express satisfaction over the volume of new business despite its shrinkage from the war boom levels.

A threatened strike in tool and die makers in this area failed to materialize, although it caused somewhat of a nervous situation in the market during the early part of the past week. Personnel departments indicate that the number of inquiries for jobs for men has dwindled, and in some instances employment managers indicate that several days pass without inquiry from persons needing positions.

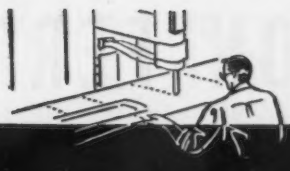
With backlogs dwindling and therefore need for some curtailment in production, manufacturers are not replacing all men who leave or are taken to the Army, thus permitting a natural decline in employment forces to handle the decrease in production.

•

Annual Meeting of Gear Makers to Be Held May 22-24

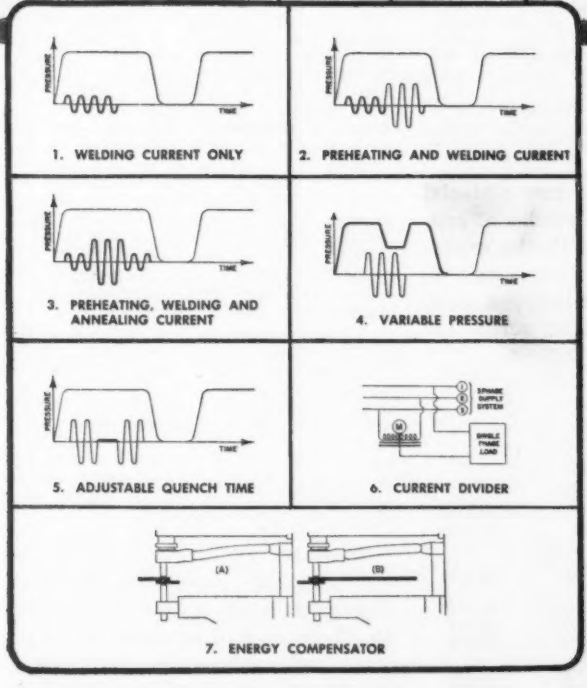
• • • **Russell C. Ball,** president, American Gear Manufacturers Association, announces that the Association is holding its 28th annual meeting at the Westchester Country Club, Rye, N. Y., on May 22, 23, and 24. The meeting will be devoted to carrying on the association's technical program in addition to considering the industry's tremendous burden of current problems.

SCIAKY HAS A MACHINE FOR YOUR LIGHT GAUGE FERROUS WELDING PROBLEM . . .

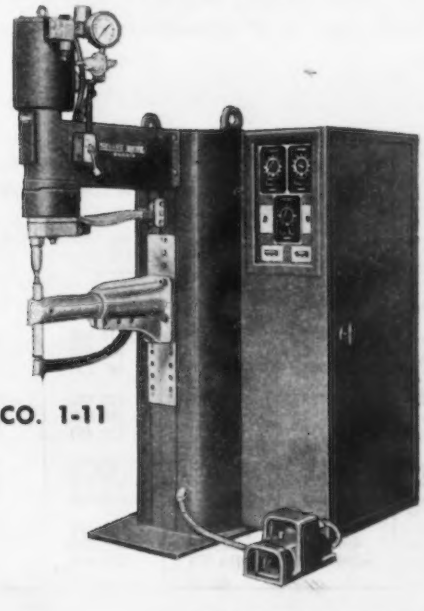


Wherever Consistent, High Shear Value Spot Welds are ESSENTIAL

TYPE	KVA RATING	THROAT DEPTH	WELDING RANGE	SPEED S/M - THK.	MAX. PRES. 90% AIR	SPECIAL FEATURES (SEE BELOW)	MATERIALS
PMCO.1-11 PRESS TYPE	60	24"	.020-.125	180 - .032	2600	1	Monel Metals, Mild, corrosion-resisting zinc-coated steels
PMCO.1-12 PRESS TYPE	60	24"	.020-.125	180 - .032	2600	2, 4, 6	Same as PMCO.1-11 plus: ordinary black & high tensile steels
PMCO.1-13 PRESS TYPE	60	24"	.020-.125	180 - .032	2600	3, 4, 5, 6	Same as PMCO.1-12 plus: some air-hardening & chrome-molybdenum steels
PMCR.1-3 ROCKER ARM	60	24"	.020-.090	180 - .032	2600	1	Same as PMCO.1-11 plus: Pickled Steels
P-1-R PORTABLE	90	*	.020-.080	*	*	1	Same as PMCR.1-3
PMCO.2 PRESS TYPE	190	34"	.032-.250	80 - .064	4000	2, 4, 6, 7	SAME AS PMCO.1-13
PMCO.2-1 PRESS TYPE	190	34"	.032-.250	80 - .064	4000	3, 4, 5, 6, 7	
PMM.2-1 SEAM WELDER	700	34"	.020-.064	400 - .040	2140	1	Monel metals, low carbon & corrosion resisting steels


1. WELDING CURRENT ONLY
2. PREHEATING AND WELDING CURRENT
3. PREHEATING, WELDING AND ANNEALING CURRENT
4. VARIABLE PRESSURE
5. ADJUSTABLE QUENCH TIME
6. CURRENT DIVIDER
7. ENERGY COMPENSATOR

These a.c. machines are specifically designed for the welding of light gauge steels. They deliver the high pressure and precise currents necessary in welding structures subject to stresses and vibration. Wherever high quality welds and fast, dependable operation is the requirement, you will find a Sciaky welder to solve your problem.



PMCO. 1-11

SCIAKY BROS.

Manufacturers of a Complete Line of
A.C and D.C Electric Resistance Welding Machines
4915 W. 67th Street, Chicago, 38, Illinois

NON-FERROUS METALS

. . . News and Market Activities

Magnesium Shipments Double in 1943

Shipments of magnesium fabricated products doubled in 1943 as compared with 1942, rising to 34,452 net tons from 18,149 tons the previous year.

This increase reflects the rising demands of the aircraft program for the light metal, where over 90 per cent of the fabricated magnesium is used. Although data on incendiary bomb castings were not revealed, it may be said that shipments of this single type of permanent mold casting exceed shipments of all other kinds of fabricated magnesium combined.

The rate of increase has been most marked in forgings and permanent mold castings (other than bombs) where shipments in 1943 rose to 227,000 and 3,978,000 lb. respectively from 42,000 and 1,364,000 lb. in 1942.

Shipments of sand castings, from the tonnage standpoint the most important of the magnesium products, trebled increasing from 32,292,000 lb. in 1942 to 59,123,000 lb. in 1943. Virtually all of this product is heat-treated for increased strength and goes into engine, wheel, and other aircraft parts.

•

1943 Brass Mill Output at Peak

The Brass mill industry reached an all-time peak production in 1943. Production was fairly well distributed with a gradual trend upward during the year. The average monthly production for 1943 was approximately 468,000,000 lb., metal weight, and for the peak fourth quarter it averaged 476,000,000.

Copper in Short Supply

• • • **A comprehensive statement** explaining the short supply of copper and copper products has been issued by WPB. The war production program is consuming such large quantities of copper and copper products that the nation is finding it difficult to match demand with production, the report said.

The output of domestic copper mines this year will certainly be less than in 1943, according to Michael Schwarz, director of the Copper Division of WPB. Demands of the armed services for men will probably make heavy inroads on the labor supply. This is already evidenced by the recall of enlisted reservists in the 18-21 year age group who had been assigned to mines, in the cancellation of specialized army training of men in the same age group, and in recent announcements on draft deferment policy for men under 26.

"However, it is imperative that all-out domestic production of copper be maintained with such manpower as is available," he added.

Allocations for March exceed anticipated production of copper. This means that the government stockpile will have to be drawn upon to make up the deficit.

Regarding the copper raw material position, WPB said, all grades of copper base alloy scrap, with the exception of brass rod turnings, are in short supply. Unalloyed copper scrap and high copper content scrap are currently insufficient to meet the requirements of producers of military and highly essential civilian items. Brass and bronze ingot production is being maintained only by the allocation of abnormally large amounts of refined copper and tin to the ingot makers.

The position as far as controlled materials are concerned was stated as follows:

1. Up to the extent of available manpower, brass strip mills are operating at close to capacity. This rate of production will be continued for the next several months. Downward revisions in small arms requirements have been largely offset by increased artillery and Navy ammunition requirements.

2. Due to the increased demand for alloy rod, it is anticipated that greater production will be required during the next few months to meet requirements. Size ½ in. diameter and smaller are in short supply, and orders in this size range are booked well into the future. Requirements for rod of greater than ½ in. diameter are running approximately in balance with available production.

3. The demand for large size alloy tubing, 5 in. diameter and larger, is very heavy, and there is no indication of relief in this size range. Condenser tubes are in the same scarce position. The position of other sizes and types of alloy tubing remain approximately in balance with available production.

4. Copper wire mill products as a whole are in tight supply. Facilities for the production of flexible cords and cables, in particular, are fully scheduled. Some additional production could be achieved in coarser sizes of bare wire, weather-proof wire, magnet wire and a few other types, provided manpower and such raw materials as rubber and yarn were available. Where claimant agencies and their contractors have advance allotments, every effort should be made to place orders for copper wire mill products, particularly flexible cords and cables, as far in advance of required delivery dates as is possible in order to permit orderly scheduling and maximum production by the copper wire and cable mills.

5. Requirements for intricate, heavy and centrifugal castings are presently utilizing practically the entire capacity of this branch of the brass and bronze foundry industry. Production schedules for simple castings require only about 60 per cent of the maximum machine capacity available for simple castings. Any increase in production of simple castings, however, is limited by the supply of raw materials and manpower.

Through the Copper Division's Copper Recovery Inventory Branch, at 350 Fifth Avenue, New York, 949,000 lb. of brass mill products and copper wire and cable were channeled into the production of military and highly essential civilian items during the month of December, 1943. In January of this year this quantity was increased to 2,263,000 lb. and in February over 3,190,000 lb. were redistributed.

Brass Mill Production

(Thousands of lb.—metal weight)

MONTH	All Products	ALLOYED PRODUCTS				Unalloyed Products
		Total	Plate, Sheet and Strip	Rod and Wire	Tube	
Total Year	5,610,026	5,226,179	3,994,819	943,870	287,490	333,847
January	464,520	426,848	316,006	83,448	27,394	37,672
February	440,210	405,792	300,638	80,276	24,878	34,418
March	499,363	461,837	341,938	93,119	26,780	37,526
April	474,727	441,479	338,430	79,493	23,566	33,248
May	484,396	452,148	345,889	82,511	23,748	32,248
June	457,671	425,627	321,459	80,646	23,522	32,044
July	425,647	396,827	304,734	70,746	21,347	28,820
August	456,808	426,356	333,049	71,456	21,851	30,452
September	479,822	450,404	355,214	72,458	22,732	29,418
October	491,356	461,774	361,472	77,578	22,724	29,582
November	491,201	461,773	359,975	77,420	24,378	29,428
December	444,305	415,314	316,015	74,729	24,570	28,991

REFINER, SMELTER PRICES

(Cents per lb. unless otherwise noted)

Aluminum, 99+%, del'd	15.00
Aluminum, No. 12 Fdy., (No. 2)	13.50
Aluminum, deoxidizing grades	12.50 to 13.75
Antimony, Asiatic, New York	Nominal
Antimony, American, f.o.b. Laredo, Tex.	14.50
Arsenic, prime white, 99%	4.00
Brass, 85-5-5-5 ingots (No. 115)	12.25
Cadmium, del'd	90.00
Cobalt, 97-99% (dollars per lb.)	$2.11
Copper, electro, Conn. Valley	12.00
Copper, electro, New York	11.75
Copper, lake	12.00
Copper, beryllium, 3.75-4.25% Be; dollars per lb. contained Be	$15.00
Gold, U. S. Treas., dollars per oz.	$35.00
Indium, 99.5%, dollars per troy oz.	$7.50
Iridium, dollars per troy oz.	$165.00
Lead, St. Louis	6.35
Lead, New York	6.50
Magnesium, 99.9+%, carlots	20.50
Magnesium, 12-in. sticks, carlots	30.00
Mercury, dollars per 76-lb. flask, f.o.b. shipping point or port of entry	$191 to $193.00
Nickel, electro	35.00
Palladium, dollars per troy oz.	$24.00
Platinum, dollars per oz.	$35.00
Silver, open market, New York, cents per oz.	44.75
Tin, Straits, New York	52.00
Zinc, East St. Louis	8.25
Zinc, New York	8.67

Copper, Copper Base Alloys

(Mill base, cents per lb.)

	Extruded Shapes	Rods	Sheets
Copper	20.87	....	20.87
Copper, H.R.	....	17.37	....
Copper, drawn	....	18.37	....
Low brass, 80%	....	20.40	20.15
High brass	....	....	19.48
Red brass, 85%	....	20.61	20.36
Naval brass	20.37	19.12	24.50
Brass, free cut	....	15.01	....
Commercial bronze, 90%	....	21.32	21.07
Commercial bronze, 95%	....	21.53	21.28
Manganese bronze	24.00	....	28.00
Phos. bronze, A, B, 5%	....	36.50	36.25
Muntz metal	20.12	18.87	22.75
Everdur, Herculoy, Olympic or equal	....	25.50	26.00
Nickel silver, 5%	....	28.75	26.50
Architect bronze	19.12	....	.

Aluminum

(Cents per lb., subject to extras on gage, size, temper, finish, factor number, etc.)

Tubing: 2 in. O.D. x 0.065 in. wall 2S, 40c. (½H); 52S, 61c. (O); 24S, 67½c. (T).

Plate: 0.250 in. and heavier: 2S and 3S, 21.2c.; 52S, 24.2c.; 61S, 22.8c.; 24S, 24.2c.

Flat Sheet: 0.188 in. thickness; 2S and 3S, 22.7c. a lb.; 52S, 26.2c.; 61S, 24.7c.; 24S, 26.7c.

2000-lb. base for tubing; 30,000-lb. base for plate, flat stock.

Extruded Shapes: "As extruded" temper: 2000-lb. base, 2S and 3S, factor No. 1 to 4, 25.5c.; 14S, factor No. 1 to 4, 35c.; 17S, factor No. 1 to 4, 31c.; 24S, factor No. 1 to 4, 34c.; 53S, factor No. 1 to 4, 28c.; 61S, factor No. 1 to 4, 28½c.

The factor is determined by dividing perimeter of shape by weight per lineal foot.

Wire Rod and Bar: Base price: 17ST and 11ST-3, screw machine stock. Rounds: ¼ in., 28½c. per lb.; ½ in., 26c.; 1 in., 24½c.; 2 in., 23c. Hexagonals: ¼ in., 34½c. per lb.; ½ in., 28½c.; 1 in., 25½c.; 2 in., 25½c. 2S, as fabricated, random or standard lengths, ¼ in., 24c. per lb.; ½ in., 25c.; 1 in., 24c.; 2 in., 23c. 24ST, rectangles and squares, random or standard lengths. 0.093-0.187 in. thick by 1.001-2.000 in. wide, 33c. per lb.; 0.751-1.500 in. thick by 2.001-4.000 in. wide, 29c.; 1.501-2.000 in. thick by 4.001-6.000 in. wide, 27½c.

Magnesium

Sheet, rod, tubes, bars, extruded shapes subject to individual quotations. Metal turnings: 100 lb. or more, 46c. a lb.; 25 to 90 lb., 56c.; less than 25 lb., 66c.

NON-FERROUS SCRAP METAL QUOTATIONS

(OPA basic maximum prices, cents per lb., f.o.b. point of shipment, subject to quality, quantity and special preparation premiums)

Copper, Copper Base Alloys

OPA Group 1

No. 1 wire, No. 1 heavy copper	9.75
No. 1 tinned copper wire, No. 1 tinned heavy copper	9.75
No. 2 wire, mixed heavy copper	8.75
Copper tuyeres	8.75
Light copper	7.75
Copper borings	9.75
No. 2 copper borings	8.75
Lead covered copper wire, cable	6.00*
Lead covered telephone, power cable	6.04
Insulated copper	5.10*

OPA Group 2

Bell metal	15.50
High grade bronze gears	13.25
High grade bronze solids	11.50*
Low lead bronze borings	11.50*
Babbitt lined brass bushings	13.00
High lead bronze solids	10.00*
High lead bronze borings	10.00*
Red trolley wheels	10.75
Tinny (phosphor bronze) borings	10.50
Tinny (phosphor bronze) solids	10.50
Copper-nickel solids and borings	9.25
Bronze paper mill wire cloth	9.50
Aluminum bronze solids	9.00
Soft red brass (No. 1 composition)	9.00
Soft red brass borings (No. 1)	9.00
Gilding metal turnings	8.50
Contaminated gilded metal solids	8.50
Unlined standard red car boxes	8.25
Lined standard red car boxes	7.75
Cocks and faucets	7.75
Mixed brass screens	7.75
Red brass breakage	7.50
Old nickel silver solids, borings	6.25
Copper lead solids, borings	6.25
Yellow brass castings	6.25

OPA Group 3

Yellow brass soft sheet clippings	8.625
Yellow rod brass turnings	8.375
Zincy bronze borings	8.00
Zincy bronze solids	8.00
Fired rifle shells	8.25
Brass pipe	7.50
Old rolled brass	7.00
Admiralty condenser tubes	7.50
Muntz metal condenser tubes	7.00
Plated brass sheet, pipe reflectors	6.50
Manganese bronze solids	7.25[1]
Manganese bronze solids	6.25[2]
Manganese bronze borings	6.50[1]
Manganese bronze borings	5.50[2]

OPA Group 4

Automobile radiators	7.00

OPA Group 5

Refinery brass	5.00*

*Price varies with analysis. [1] Lead content 0.00 to 0.40 per cent. [2] Lead content 0.41 to 1.00 per cent.

Other Copper Alloys

Briquetted Cartridge Brass Turnings	8.625
Cartridge Brass Turnings, Loose	7.875
Loose Yellow Brass Trimmings	7.875

Aluminum

Plant scrap, segregated

2S solids	9.00
All other solids	8.50
Borings and turnings	
W'rt alloys (17S, 18S, 32S, 52S)	7.50
High grade alloys	7.00
Low grade alloys	6.50

Plant scrap, mixed

All solids	7.50
Borings and turnings	5.50

Obsolete scrap

Pure cable	9.00
Old sheet and utensils	7.50
Old castings and forgings	8.00
Pistons, free of struts	8.00
Pistons, with struts	6.00
Old alloy sheet	7.00

For old castings and forgings, pistons, sheets, add ½c. lb. for lots 1000 to 19,999 lb.; for other scrap add 1c.; for lots over 19,999 lb. add 1½c. a lb.

Magnesium

Segregated plant scrap

Pure solids and all other solids, exempt	
Borings and turnings	8.00

Mixed, contaminated plant scrap

Grade 1 solids	11.00
Grade 1 borings and turnings	7.00
Grade 2 solids	9.00
Grade 2 borings and turnings	5.00

For lots over 1499 lb. add 1c. per lb.

Zinc

New zinc clippings, trimmings	7.25
Engravers', lithographers' plates	7.25
Old zinc scrap	5.75
Unsweated zinc dross	5.80
Die cast slab	5.80
New die cast scrap	4.95
Radiator grilles, old and new	4.95
Old die cast scrap	4.50

Lead

Deduct 0.55c. a lb. from refined metal basing point prices or soft and hard lead inc. cable, for f.o.b. point of shipment price.

Nickel

Ni content 98+%, Cu under ½%, 26c. per lb.; 90 to 98% Ni, 26c. per lb. contained Ni.

ELECTROPLATING ANODES AND CHEMICALS

Anodes

(Cents per lb., f.o.b. shipping point)

Copper: Cast, elliptical, 15 in. and longer	25⅛
Electrolytic, full size	22⅞
cut to size	30⅛
Rolled, oval, straight, 15 in. and longer	23¼
Curved	24¼
Brass: Cast, 82-20, elliptical, 15 in. and longer	23⅝
Zinc: Cast, 99.99, 16 in. and over	16¼
Nickel: 99% plus, cast	47
Rolled, depolarized	48
Silver: Rolled, 999 fine per Troy (1-9) oz., per oz.	58

Chemicals

(Cents per lb., delivery from New York)

Copper cyanide, tech., 100-lb. bbls. 1-5	5.65
Copper sulphate, 99.5 crystals, bbls.	13.00–13.50
Nickel salts, single, 425-lb. bbls.	34.00
Silver cyanide, 100 oz., lots	40.82–41.125
Sodium cyanide, 96% dom., 100-lb. dms.	0.15
Zinc cyanide, 100-lb. dms.	33.00
Zinc, sulphate, 89% crystals, bbls.	6.80

SCRAP

. . . News and Market Activities

WPB Denies Plan to Make Alloy Scrap Use in Blast Furnace Compulsory

Washington

• • • There has been a rumor that WPB is considering an order which would make it compulsory to use alloy scrap in the blast furnace. WPB denied that such a proposal is being considered. It is believed that the report arises from a lack of a clear understanding of the order requiring certain percentages of alloy scrap in the open hearth and electric furnace for the production of alloy steel. This order itself grants producers credits on these percentages when charging blast furnaces with alloy scrap. The order requires a charge of 60 per cent alloy scrap in the electric furnace and of 50 per cent in the open hearth furnace, except when allowance is made for hot alloy metal from the blast furnace.

The principal grades of scrap used in the blast furnace are turnings, borings, and cast scrap, the latter consisting principally of stove plate. There is an excess of the two former grades, with a great bulk of the tonnage in turnings containing chromium, nickel and molybdenum, since much of this tri-alloy scrap comes from war production.

There has been a sharp increase the past two years in the amount of scrap used in the blast furnace. In 1943, scrap used in blast furnaces totaled 3,286,000 gross tons, an increase of 21 per cent over the 2,622,000 tons charged in 1942. Of the quantity used last year, 1,335,000 was home scrap and 1,951,000 was purchased scrap. Production of pig iron in 1943 was 53,826,000 tons, while the total consumption of scrap was 55,088,000 tons of which 31,291,000 tons was home and 33,797,000 tons was purchased scrap.

Scrap charged in the blast furnace in 1942 consisted of 1,397,000 tons of home and 1,225,000 tons of purchased old material. Pig iron production in that year aggregated 52,716,000 tons and scrap consumption totaled 53,808,000 tons of which 29,580,000 tons was home and 24,228,000 tons was purchased tonnage.

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Bendix Aviation Salvage Program

• • • Segregation of metals by alloy types throughout all production stages is the key to the salvage program at the Bendix Products division of Bendix Aviation Corp. Steel chips and shavings, which are classified in six different alloys, represent the biggest item in the plant's metal salvage program. A total of 1,750,000 lb. of steel was salvaged in January.

During an average month the plant salvages 100,000 lb. of cast iron; 160,000 lb. of aluminum in 11 different alloys; 35,000 lb. of magnesium in five alloys and 15,000 lb. of brass in three alloys. Marked containers are used to collect and segregate metals of various alloys—from machines to loading platforms.

To overcome recurrent shortages of zinc, vital in the production of aircraft carburetors, the materials department with the aid of Bendix distributors all over the nation, buy up used and junked automotive carburetors. From these worn-out parts, the plant now obtains 10,000 lb. of zinc and about 5000 lb. of aluminum per month for use in the company's South Bend foundry and die-casting departments.

In addition the plant also recovers monthly about 8000 gal. of cutting oils and approximately 16 tons of such miscellaneous materials as graphite, emery wheels, wooden kegs and barrels, burlap bags and wire and metal bindings.

•

PITTSBURGH—There is a good market for heavy melting grades, but no tight spots. Incoming shoveling turnings are still demanding and getting the full springboard. No signs of any scrap shortage in the near future.

•

CLEVELAND—Purchases for local consumption continue at a standstill, with one consumer expected in the blast furnace market about the first of the month. Inventories locally seem comfortable and little buying is anticipated soon. Open hearth and blast furnace grades continue to move out of the city. Collections are bad and the yard manpower situation is getting worse due to heavier drafting.

•

CINCINNATI—The scrap market here shows relatively no change except a slight strengthening in turnings as the result of a tightening of the market in the Pennsylvania area. Consumers in the area are being reasonably well supplied and currently no sales under the ceiling price are reported.

•

PHILADELPHIA—All mills are taking scrap shipments. Although the quantity going to each mill has diminished because of the greater number in the market, there have been no complaints about reduced tonnages. Turnings are being sold on a somewhat regulated schedule and low phos is still impossible to move except to one consumer taking a limited supply.

•

BUFFALO—No evidence of an overabundance of scrap in this district appeared during the week. One consumer who has not been actively buying of late has returned to the market on a moderate basis to avoid biting too deeply into his stockpile. Cast iron borings and mixed borings and turnings are scarce.

•

BIRMINGHAM—A few carloads of cast grades from this area are moving to Northern mills which will absorb up to $8 freight charges from shipping point, according to trade sources here. Mills in this district are still accepting open hearth and blast furnace material but will not absorb maximum springboard allowances on freight. Markets for foundry and electric furnace grades of steel scrap remain stagnant.

•

BOSTON—Supplies of scrap and labor have become so tight yards are beginning to talk of no improvement for the duration and even immediately after the ending of war. There is little in postwar plans that suggests an increase in scrap supplies and yards figure it will take time for returning labor to adjust itself to a standard of wage yards can afford to pay. Some yardsmen now say that with the labor situation as it is they don't want to take in any more scrap than they actually have to; that they might get caught on a falling market.

•

CHICAGO—More pronounced weakness is evidenced in blast furnace grades, with future tendencies dependent upon a single dominant purchase remaining in the market. Possibility appears slight of firming in the immediate future. Weakness also is more evident in machine shop turnings. Alloy and electric furnace grades remain a drug on the market, but heavy melting steel continues firm.

SCRAP

. . News and Market Activities

Railroad Steel and Cast Scrap Price Schedule

BASING POINT	No. 1 and No. 2 Heavy Melting; Wrought Iron and/or Steel Wheels; No. 2 Steel Wheels; Iron and/or Steel Axles; Uncut Bolster and Side Frames	No. 1 Bushelings; Steel and Iron Arch Bars; Boilers, Fire Boxes, and Tanks; No. 2 Cast Steel; Flues, Tubes, and Pipes; Limed Iron and Steel; Uncut Structural Wrought Iron and/or Steel; Destroyed Cars and Locomotive Tenders	No. 2 Bushelings	No. 1 Turnings	No. 2 Turnings, Drillings, and Borings	Uncut Frogs and Switches	No. 1 Sheet Scrap	No. 2 Sheet Scrap	Scrap Rails, Random Length; Iron Arch Bars, 3 ft. and Under	Rerolling Rails for Rerolling; Uncut Tires; Cut Bolsters and Side Frames; Angles and Splice Bars	Cut Rails, 3 ft. and Under	Cut Rails, 2 ft. and Under	Cut Rails, 18-in. and Under; No. 3 Steel Wheels; Spring Steel; Couples and Knuckles	Cut Tires	Solid Steel Axles For Rerolling or Reforging Use Only. Base Price For Other Uses
						(Dollars Per Gross Ton)									
Pittsburgh, Canton, Youngstown, Wheeling, Sharon, Steubenville	$21.00	$20.00	$17.50	$19.50	$15.00	$20.50	$16.00	$14.00	$22.00	$23.50	$24.00	$24.25	$24.50	$25.50	$27.00
Cleveland, Cincinnati, Ashland, Portsmouth, Middletown	20.50	19.50	17.00	19.00	14.50	20.00	15.50	13.50	21.50	23.00	23.50	23.75	24.00	25.00	26.50
Chicago, Philadelphia, Sparrows Point, Wilmington	19.75	18.75	16.25	18.25	13.75	19.25	14.75	12.75	20.75	22.25	22.75	23.00	23.25	24.25	25.75
Buffalo	20.25	19.25	16.75	18.75	14.25	19.75	15.25	13.25	21.25	22.75	23.25	23.50	23.75	24.75	26.25
Kokomo	19.25	18.25	15.75	17.75	13.25	18.75	14.25	12.25	20.25	21.75	22.25	22.50	22.75	23.75	25.25
Duluth	19.00	18.00	15.50	17.50	13.00	18.50	14.00	12.00	20.00	21.50	22.00	22.25	22.50	23.50	25.00
Detroit	18.85	17.85	15.35	17.35	12.85	18.35	13.85	11.85	19.85	21.35	21.85	22.10	22.35	23.35	24.85
St. Louis	18.50	17.50	15.00	17.00	12.50	18.00	13.50	11.50	19.50	21.00	21.50	21.75	22.00	23.00	24.50
Birmingham, Los Angeles, San Francisco	18.00	17.00	14.50	16.50	12.00	17.50	13.00	11.00	19.00	20.50	21.00	21.25	21.50	22.50	24.00
Kansas City	17.00	16.00	13.50	15.50	11.00	16.50	12.00	10.00	18.00	19.50	20.00	20.25	20.50	21.50	23.00
Seattle	15.00	14.00	11.50	13.50	9.00	14.50	10.00	8.00	16.00	17.50	18.00	18.25	18.50	19.50	21.00

SALES REGULATIONS: On and after March 15, 1944, no operating railroad not operating in a basing point named may sell or offer for sale iron and steel scrap to a consumer or his broker without obtaining prior written approval from OPA unless prior to that date it has filed with OPA a statement in writing setting forth maximum on-line price for No. 1 Railroad Heavy Melting Steel and describing the method used to calculate this price. The statement shall include: The most favorable basing point selected; the price at such basing point; the location of the scrap accumulation point; the lowest established charge for transporting scrap by rail from such accumulation point to the named basing point; and the foreign line proportion of such lowest established charge.

MAXIMUM PRICES: The maximum on-line price of any grade of steel scrap from an operating railroad operating in a basing point shall be the price set for the scrap at the highest priced basing point in which the railroad operates. For an operating railroad not operating in a basing point, the price shall be the price set for the scrap at the most favorable basing point less the foreign line proportion of the lowest charge for transporting scrap by rail from scrap accumulating point of railroad to such basing point. "Scrap accumulation point is that point from which greatest tonnage was shipped in 1943. "Most favorable basing point" that the basing point which will yield the highest maximum on-line price. In no case need the on-line maximum price fall below $15.00 per gross ton for No. 1 Railroad Heavy Melting Steel. The maximum price of any grade of steel scrap originating from a non-operating railroad shall be the price established for the scrap at the most favorable basing point minus the transportation charges for rail, vessel, or motor vehicle shipment or combinations of these, and for established charges shown in OPA Price Schedule No. 4. Where the non-operating railroad is located in a basing point shown above, the following switching charge deductions will be applicable: Chicago—84c.; Pittsburgh—55c.; Detroit—53c.; Cleveland, Los Angeles, San Francisco, Sharon, and Youngstown—42c.; Seattle—38c.; Buffalo—36c.; Birmingham and Kansas City—32c.; Ashland, Canton, Cincinnati, Duluth, Kokomo, Portsmouth, Steubenville, St. Louis, Wheeling, and Wilmington—28c.; Middletown and Philadelphia—14c.; and Sparrows Point—11c.

SCRAP PREPARATION: With the exception of unprepared scrap prepared in-transit, railroad steel scrap prepared by a dealer or moving through a dealer's yard shall be deemed to have lost its railroad origin, and shall be classified and priced as steel scrap other than railroad scrap except in specified grades peculiar to railroad origin (listed in the schedule). For these listed grades the maximum shipping point and delivered prices shall be the same as those established for non-operating railroads for those grades. The maximum shipping point price of any grade of railroad cast iron scrap sold by a dealer shall be the same as that established for the railroad seller. "Unprepared scrap" shall have its customary trade meaning and shall not include such demolition projects as bridges or box cars which must be so priced that the prepared scrap will deliver to the consumer within the maximum delivered price established.

PREPARATION CHARGES: If unprepared scrap is purchased from an originating railroad, the consumer may designate a dealer to prepare such scrap on a preparation fee basis. The maximum preparation fee shall be the established differentials between the unprepared scrap and the listed grade for which the scrap is prepared. For example: $3.50 per gross ton for prepared No. 1 Railroad Heavy Melting Steel from Structural and/or Wrought Iron and Steel Uncut; or $2.50 for cutting rails 18-in. and under from Scrap Rails of Random Lengths; or $4.00 per ton for No. 2 Bundles prepared from No. 1 Sheet Scrap. For cast, an in-transit preparation fee will be applicable only for preparing Cast Iron No. 3 into Cast Iron No. 1, for which the maximum preparation fee shall be $3.50 per gross ton. (Previous dealer fee was $2.50.)

MAXIMUM PRICE ON PREPARED SCRAP: The maximum delivered price for railroad scrap prepared in-transit shall be the maximum on-line price for the unprepared scrap, plus the applicable rail transportation charges incurred in moving scrap to dealer's yard, plus the applicable preparation fee, plus transportation charges from the dealer's yard to point of delivery.

Cast Iron Scrap

Maximum on-line price, per gross ton, for any of the following cast grades will be the price shown at the highest priced zone in which the railroad operates or is located.

	Per Gross Ton		
	Zone A	Zone B	Zone C
Cast Iron, No. 1	$18.00	$19.00	$20.00
Cast Iron, No. 2	17.00	18.00	19.00
Cast Iron, No. 3	14.50	15.50	16.50
Cast Iron, No. 4	13.25	14.25	15.25
Cast Iron Brake Shoes	13.25	14.25	15.25
Malleable	20.00	21.00	22.00
Wheels, No. 1	18.00	19.00	20.00

Zone A includes Mont., Idaho, Wyo., Nev., Utah, Ariz., and N. M. Zone B includes N. D., S. D., Neb., Colo., Kan., Okla., Texas, and Fla. Zone C includes all states not named in zones A and B, and includes switching district of Kansas City, Kansas-Missouri.

CAST IRON GRADE DEFINITIONS: Cast Iron, No. 1—Cast iron scrap such as columns, pipe, plates and/or castings of miscellaneous nature, but free from stove plate, brake shoes, and/or burnt scrap. Must be cupola size not over 24 x 30 in. and no pieces to weigh more than 150 lb. Free of foreign material. No. 2—Cast iron scrap in pieces weighing over 150 lb. not more than 500 lb. and free from burnt cast. No. 3—Cast iron scrap in pieces over 500 lb., includes cylinders, driving wheel centers, and/or all other castings. Free from hammer blocks or bases. No. 4—Burnt cast iron scrap such as grate bars, stove parts, and/or miscellaneous burnt scrap. No. 5—Driving and/or car brake shoes of all types except composition filled. Malleable—Malleable parts of automobiles, railroad cars, and locomotives. No. 7—Wheels, No. 1, includes cast iron car and/or locomotive wheels.

Comparison of Prices . . .

Advance Over Past Week in **Heavy Type**; Declines in *Italics*.

[Prices Are F.O.B. Maior Basing Points]*

(Cents Per Lb.)	Mar. 28, 1944	Mar. 21, 1944	Feb. 22, 1944	Mar. 30, 1943
Hot rolled sheets	2.10	2.10	2.10	2.10
Cold rolled sheets	3.05	3.05	3.05	3.05
Galvanized sheets (24 ga.)	3.50	3.50	3.50	3.50
Hot rolled strip	2.10	2.10	2.10	2.10
Cold rolled strip	2.80	2.80	2.80	2.80
Plates	2.10	2.10	2.10	2.10
Plates, wrought iron	3.80	3.80	3.80	3.80
Stain's c.r. strip (No. 302)	28.00	28.00	28.00	28.00
Tin and Terne Plate: (Dollars Per Base Box)				
Tin plate, standard cokes	$5.00	$5.00	$5.00	$5.00
Tin plate, electrolytic	4.50	4.50	4.50	4.50
Special coated mfg. ternes	4.30	4.30	4.30	4.30
Bars and Shapes: (Cents Per Lb.)				
Merchant bars	2.15	2.15	2.15	2.15
Cold finished bars	2.65	2.65	2.65	2.65
Alloy bars	2.70	2.70	2.70	2.70
Structural shapes	2.10	2.10	2.10	2.10
Stainless bars (No. 302)	24.00	24.00	24.00	24.00
Wrought iron bars	4.40	4.40	4.40	4.40
Wire and Wire Products: (Cents Per Lb.)				
Plain wire	2.60	2.60	2.60	2.60
Wire nails	2.55	2.55	2.55	2.55
Rails: (Dollars Per Gross Ton)				
Heavy rails	$40.00	$40.00	$40.00	$40.00
Light rails	40.00	40.00	40.00	40.00
Semi-Finished Steel: (Dollars Per Gross Ton)				
Rerolling billets	$34.00	$34.00	$34.00	$34.00
Sheet bars	34.00	34.00	34.00	34.00
Slabs, rerolling	34.00	34.00	34.00	34.00
Forging billets	40.00	40.00	40.00	40.00
Alloy blooms, billets, slabs	54.00	54.00	54.00	54.00
Wire Rods and Skelp: (Cents Per Lb.)				
Wire rods	2.00	2.00	2.00	2.00
Skelp	1.90	1.90	1.90	1.90

(Per Gross Ton)	Mar. 28, 1944	Mar. 21, 1944	Feb. 22, 1944	Mar. 30, 1943
No. 2 fdy., Philadelphia	$25.84	$25.84	$25.89	$25.89
No. 2, Valley furnace	24.00	24.00	24.00	24.00
No. 2, Southern Cin'ti	23.94	23.94	23.94	24.68
No. 2, Birmingham	20.38	20.38	20.38	20.38
No. 2, foundry, Chicago†	24.00	24.00	24.00	24.00
Basic, del'd eastern Pa.	25.34	25.34	25.34	25.39
Basic, Valley furnace	23.50	23.50	23.50	23.50
Malleable, Chicago†	24.00	24.00	24.00	24.00
Malleable, Valley	24.00	24.00	24.00	24.00
L. S. charcoal, Chicago	37.34	37.34	37.34	37.34
Ferromanganese‡	135.00	135.00	135.00	135.00

†The switching charge for delivery to foundries in the Chicago district is 60c. per ton.
‡For carlots at seaboard.

Scrap: (Per Gross Ton)				
Heavy melt'g steel, P'gh.	$20.00	$20.00	$20.00	$20.00
Heavy melt'g steel, Phila.	18.75	18.75	18.75	18.75
Heavy melt'g steel, Ch'go	18.75	18.75	18.75	18.75
No. 1 hy. comp. sheet, Det.	17.85	17.85	17.85	17.85
Low phos. plate, Youngs'n	22.50	22.50	22.50	22.50
No. 1 cast, Pittsburgh	20.00	20.00	20.00	20.00
No. 1 cast, Philadelphia	20.00	20.00	20.00	20.00
No. 1 cast, Ch'go	20.00	20.00	20.00	20.00
Coke, Connellsville: (Per Net Ton at Oven)				
Furnace coke, prompt	$7.00	$7.00	$6.50	$6.00
Foundry coke, prompt	8.25	7.50	7.50	6.875
Non-Ferrous Metals: (Cents per Lb. to Large Buyers)				
Copper, electro., Conn.	12.00	12.00	12.00	12.00
Copper, Lake	12.00	12.00	12.00	12.00
Tin (Straits), New York	52.00	52.00	52.00	52.00
Zinc, East St. Louis	8.25	8.25	8.25	8.25
Lead, St. Louis	6.35	6.35	6.35	6.35
Aluminum, Virgin, del'd.	15.00	15.00	15.00	15.00
Nickel, electrolytic	35.00	35.00	35.00	35.00
Magnesium, ingot	20.50	20.50	20.50	22.50
Antimony (Asiatic), N. Y.	16.50	16.50	16.50	16.50

The various basing points for finished and semi-finished steel are listed in the detailed price tables, pages 121-135.

Composite Prices . . .

Starting with the issue of April 22, 1943, the weighted finished steel price index was revised for the years 1941, 1942 and 1943. See explanation of the change on page 90 of the April 22, 1943, issue.

	FINISHED STEEL	PIG IRON	SCRAP STEEL
March 28, 1944	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One week ago	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One month ago	2.25513c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton
One year ago	2.26190c. a Lb.	$23.61 a Gross Ton	$19.17 a Gross Ton

	FINISHED STEEL HIGH	FINISHED STEEL LOW	PIG IRON HIGH	PIG IRON LOW	SCRAP STEEL HIGH	SCRAP STEEL LOW
1943	2.25513c.,	2.25513c.,	$23.61	$23.61	$19.17	$19.17
1942	2.26190c.,	2.26190c.,	23.61	23.61	19.17	19.17
1941	2.43078c.,	2.43078c.,	$23.61, Mar. 20	$23.45, Jan. 2	$22.00, Jan. 7	$19.17, Apr. 10
1940	2.30467c., Jan. 2	2.24107c., Apr. 16	23.45, Dec. 23	22.61, Jan. 2	21.83, Dec. 30	16.04, Apr. 9
1939	2.35367c., Jan. 3	2.26689c., May 16	22.61, Sept. 19	20.61, Sept. 12	22.50, Oct. 3	14.08, May 16
1938	2.58414c., Jan. 4	2.27207c., Oct. 18	23.25, June 21	19.61, July 6	15.00, Nov. 22	11.00, June 7
1937	2.58414c., Mar. 9	2.32263c., Jan. 4	23.25, Mar. 9	20.25, Feb. 16	21.92, Mar. 30	12.67, June 8
1936	2.32263c., Dec. 28	2.05200c., Mar. 10	19.74, Nov. 24	18.73, Aug. 11	17.75, Dec. 21	12.67, June 9
1935	2.07642c., Oct. 1	2.06492c., Jan. 8	18.84, Nov. 5	17.83, May 14	13.42, Dec. 10	10.33, Apr. 29
1934	2.15367c., Apr. 24	1.95757c., Jan. 2	17.90, May 1	16.90, Jan. 27	13.00, Mar. 13	9.50, Sept. 25
1933	1.95578c., Oct. 3	1.75836c., May 2	16.90, Dec. 5	13.56, Jan. 3	12.25, Aug. 8	6.75, Jan. 3
1932	1.89196c., July 5	1.83901c., Mar. 1	14.81, Jan. 5	13.56, Dec. 6	8.50, Jan. 12	6.43, July 5
1931	1.99626c., Jan. 13	1.86586c., Dec. 29	15.90, Jan. 6	14.79, Dec. 15	11.33, Jan. 6	8.50, Dec. 29
1930	2.25488c., Jan. 7	1.97319c., Dec. 9	18.21, Jan. 7	15.90, Dec. 16	15.00, Feb. 18	11.25, Dec. 9
1929	2.31773c., May 28	2.26498c., Oct. 29	18.71, May 14	18.21, Dec. 17	17.58, Jan. 29	14.08, Dec. 3

Weighted index based on steel bars, beams, tank plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing 78 per cent of the United States output. Index recapitulated in Aug. 28, 1941, issue.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Southern iron at Cincinnati.

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.

. . . Prices of Finished Iron and Steel

Steel prices shown here are f.o.b. basing points, in cents per lb., unless otherwise indicated. Extras apply. Delivered prices do not reflect 3% tax on freight. (1) Mill run sheet, 10c. per 100 lb. under base; primes 25c. above base. (2) Unassorted 8-lb. coating. (3) Widths up to 12-in. (4) 0.25 carbon and less. (5) Applies to certain width and length limitations. (6) For merchant trade. (7) For straight length material only from producer to consumer. Discount of 25c. per 100 lb. to fabricators. (8) Also shafting. For quantities of 20,000 to 29,999 lb. (9) Carload lot in manufacturing trade. (10) Prices do not apply if rail and water is used. (12) Boxed. (13) Portland and Seattle price, San Francisco 2.50c. (14) This base price to be used in figuring annealed, bright finish wires, commercial spring wire.

Basing Point → / Product ↓	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio	Gulf Ports, Cars	Pacific Ports, Cars[16]	DELIVERED TO Detroit	New York	Philadelphia
Hot Rolled Sheets	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢	2.20¢	2.10¢		2.65¢	2.20¢	2.34¢	2.27¢
Cold Rolled Sheets[1]	3.05¢	3.05¢	3.05¢	3.05¢		3.05¢	3.05¢		3.15¢	3.05¢		3.70¢	3.15¢	3.39¢	3.37¢
Galvanized Sheets (24 gage)	3.50¢	3.50¢	3.50¢		3.50¢	3.50¢	3.50¢	3.50¢	3.60¢	3.50¢		4.05¢		3.74¢	3.67¢
Enameling Sheets (20 gage)	3.35¢	3.35¢	3.35¢	3.35¢			3.35¢		3.45¢	3.35¢		4.00¢	3.45¢	3.71¢	3.67¢
Long Ternes[3]	3.80¢	3.80¢	3.80¢									4.55¢		4.16¢	4.12¢
Hot Rolled Strip[2]	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢			2.10¢		2.75¢	2.20¢	2.46¢	
Cold Rolled Strip[4]	2.80¢	2.90¢		2.80¢			2.80¢	(Worcester = 3.00¢)					2.90¢	3.16¢	
Cooperage Stock Strip	2.20¢	2.20¢			2.20¢		2.20¢							2.56¢	
Commodity C-R Strip	2.95¢	3.05¢		2.95¢			2.95¢	(Worcester = 3.35¢)					3.05¢	3.31¢	
Coke Tin Plate, Base Box	$5.00	$5.00	$5.00						$5.10					5.36¢	5.32¢
.50 / .75 Electro Tin Plate, Box	$4.50	$4.50	$4.50						$4.60						
	$4.65		$4.65						$4.75						
Black Plate (29 gage)[4]	3.05¢	3.05¢	3.05¢						3.15¢			4.05¢[13]			3.37¢
Mfg. Ternes, Special Box	$4.30	$4.30	$4.30						$4.40						
Carbon Steel Bars	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢		(Duluth = 2.25¢)			2.50¢	2.80¢	2.25¢	2.49¢	2.47¢
Rail Steel Bars[6]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢					2.50¢	2.80¢			
Reinforcing (Billet) Bars[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢			2.50¢	2.55¢[13]	2.25¢	2.39¢	
Reinforcing (Rail) Bars[7]	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢	2.15¢				2.50¢	c2.55¢[13]	2.25¢		2.47¢
Cold Finished Bars[8]	2.65¢	2.65¢	2.65¢	2.65¢		2.65¢		(Detroit = 2.70¢)			(Toledo = 2.80¢)			2.99¢	2.97¢
Alloy Bars, Hot Rolled	2.70¢	2.70¢				2.70¢		(Bethlehem, Massillon, Canton = 2.70¢)					2.80¢		
Alloy Bars, Cold Drawn	3.35¢	3.35¢	3.35¢	3.35¢		3.35¢							3.45¢		
Carbon Steel Plates	2.10¢	2.10¢	2.10¢	2.10¢	2.10¢		2.10¢	(Coatesville and Claymont = 2.10¢) 2.10¢	2.35¢		2.45¢	2.65¢	2.32¢	2.29¢	2.15¢
Floor Plates	3.35¢	3.35¢									3.70¢	4.00¢		3.71¢	3.67¢
Alloy Plates	3.50¢	3.50¢			(Coatesville = 3.50¢)						3.95	4.15¢		3.70¢	3.59¢
Structural Shapes	2.10¢	2.10¢	2.10¢		2.10¢	2.10¢		(Bethlehem = 2.10¢)			2.45¢	2.75¢		2.27¢	2.215¢
SPRING STEEL, C-R 0.26 to 0.50 Carbon	2.80¢			2.80¢			(Worcester = 3.00¢)								
0.51 to 0.75 Carbon	4.30¢			4.30¢			(Worcester = 4.50¢)								
0.76 to 1.00 Carbon	6.15¢			6.15¢			(Worcester = 6.35¢)								
1.01 to 1.25 Carbon	8.35¢			8.35¢			(Worcester = 8.55¢)								
Bright Wire[14]	2.60¢	2.60¢		2.60¢	2.60¢		(Worcester = 2.70¢)		(Duluth = 2.65¢)			3.10¢			2.92¢
Galvanized Wire	Add proper size extra and galvanizing extra to Bright Wire base.														
Spring (High Carbon)	3.20¢	3.20¢		3.20¢			(Worcester = 3.30¢)					3.70¢			3.52¢
Steel Sheet Piling	2.40¢	2.40¢				2.40¢						2.95¢			2.72¢

EXCEPTIONS TO PRICE SCHED. NO. 6

Slabs—Andrews Steel Co. $41 basing pts.; Wheeling Steel Corp. $34 Portsmouth, Ohio; Empire Sheet & Tin Plate Corp. $41; Phoenix Iron Co. (rerolling) $41, (forging) $47; Granite City Steel Co. $47.50.

Blooms—Phoenix Iron Co. (rerolling) $41, (forging) $47.

Sheet Bar—Empire Sheet & Tin Plate Co. $39 mill; Wheeling Steel Corp. $38 Portsmouth, Ohio.

Billets, Forging—Andrews Steel Co. $50 basing pts.; Follansbee Steel Corp. $49.50 Toronto; Phoenix Iron Co. $47.00 mill.

Billets, Rerolling—Continental Steel Corp. may charge Acme Steel in Chicago switching area $34 plus freight from Kokomo, Ind.; Northwestern Steel & Wire Co. (Lend-Lease) $41 mill; Wheeling Steel Corp. (small) $36 Portsmouth, Ohio; (blooming mill sizes) applicable base, f.o.b. Portsmouth, Ohio; Stanley Works may sell Washburn Wire Co. under allocation at $39 Bridgeport, Conn.; Keystone Steel & Wire Co. may sell Acme Steel Co. at Chicago base, f.o.b. Peoria; Phoenix Iron Co. $41 mill; Continental Steel Corp. (1¾ x 1¾) $39.50, (2 x 2) $40.60 Kokomo, Ind. (these prices include $1 size extra); Keystone Steel & Wire Co. $36.40 Peoria; Connors Steel Co. $50.69 Birmingham; Ford Motor Co. $34 Dearborn, Mich.

Structural Shapes—Phoenix Iron Co. $2.35 basing pts., (export) $2.50 Phoenixville; Knoxville Iron Co. $2.30 basing pts.

Bar Size Shapes—(Angles) W. Ames & Co., 10 tons or over, $3.10 mill.

Rails—Sweet Steel Co. (rail steel) $50 mill; West Virginia Rail Co. (lightweight) on allocation based Huntington, W. Va.; Colorado Fuel & Iron Corp. $45 Pueblo.

Hot Rolled Plate—Granite City Steel Co. $2.65 mill; Knoxville Iron Co. $2.25 basing pts.; Kaiser Co. $3.20 Pacific Ports.

Merchant Bars—W. Ames & Co., 10 tons and over, $2.85 mill; Eckels-Nye Steel Corp., $2.50 basing pts. (rail steel) $2.40; Phoenix Iron Co. $2.40 basing pts.; Sweet Steel Co. (rail steel) $2.35 mill; Joslyn Mfg. & Supply Co. $2.35 Chicago; Central Iron & Steel Co. $2.20 basing pts.; Granite City Steel Co. $2.35 Granite City; Calumet Steel Div., Borg Warner Corp. (8 in. mill bars) $2.35 Chicago; Knoxville Iron Co. $2.30 basing pts. Laclede Steel Co., sales to LaSalle Steel granted Chicago base, f.o.b. Madison, Ill.

Reinforcing Bars—W. Ames & Co., 10 tons and over, $2.85 mill; Sweet Steel Co. (rail steel) $2.35 mill; Columbia Steel Co. $2.50 Pacific Ports.

Cold Finished Bars—Keystone Drawn Steel Co. on allocation, Pittsburgh c.f. base plus c/l freight on hot rolled bars Pittsburgh to Spring City, Pa.; New England Drawn Steel Co. on allocation outside New England, Buffalo c.f. base plus c/l freight Buffalo to Massfield, Mass., f.o.b. Massfield.; Empire Finished Steel Corp. on allocation outside New England, Buffalo c.f. base plus c/l freight Buffalo to plants f.o.b. plant; Compressed Steel Shafting Co. on allocation outside New England, Buffalo base plus c/l freight Buffalo to Readville, Mass. f.o.b. Readville; Medart Co. in certain areas, Chicago c.f. base plus c/l freight Chicago to St. Louis, f.o.b. St. Louis.

Alloy Bars—Texas Steel Co. for delivery except Texas and Okla. Chicago base, f.o.b. Fort Worth, Tex.; Connors Steel Co. shipped outside Ala., Mississippi, Louisiana, Georgia, Florida, Tenn., Pittsburgh base, f.o.b. Birmingham.

Hot Rolled Strip—Joslyn Mfg. & Supply Co. $2.30 Chicago; Knoxville Iron Co. $2.25 basing pts.

Hot Rolled Sheets—Andrews Steel Co., Middletown base on shipments to Detroit or area; Parkersburg Iron & Steel Co., $2.25 Parkersburg.

Galvanized Sheets—Andrews Steel Co., $3.75 basing pts.; Parkersburg Iron & Steel Co. $3.85 Parkersburg; Apollo Steel Co. $3.75 basing pts.; Continental Steel Co., Middletown base on Kokomo, Ind., product; Superior Sheet Steel Co., Pittsburgh base except for Lend-Lease.

Pipe and Tubing—South Chester Tube Co. when priced at Pittsburgh, freight to Gulf Coast and Pacific Ports may be charged from Chester, Pa., also to points lying west of Harrisburg, Pa.

Black Sheets—Empire Sheet and Tinplate Co., maximum base price mill is $2.45 per 100 lb., with differentials, transportation charges, etc., provided in RPS. No. 6.

WAREHOUSE PRICES

Delivered metropolitan areas per 100 lb. These are zoned warehouse prices in conformance with latest zoning amendments to OPA Price Schedule 49.

Cities	SHEETS			STRIP		Plates ¼ in. and heavier	Structural Shapes	BARS		ALLOY BARS			
	Hot Rolled (10 gage)	Cold Rolled	Galvanized (24 gage)	Hot Rolled	Cold Rolled			Hot Rolled	Cold Finished	Hot Rolled, NE 8617-20	Hot Rolled, NE 9442-45 Ann.	Cold Drawn, NE 8617-20	Cold Drawn, NE 9442-45 Ann.
**Philadelphia	3.518	4.872[8]	5.018[a]	3.922	4.772	3.605	3.666	3.822	4.072	5.966	7.066	7.272	8.322
New York	3.590	4.613[3]	5.010	3.974[6]	4.772	3.768	3.758	3.753	4.103	6.008	7.108	7.303	8.353
Boston	3.744	4.744[9]	5.224[9]	4.106	4.715	3.912	3.912	4.044	4.144	6.162	7.262	7.344	8.394
Baltimore	3.394	4.852	4.894	3.902	4.752	3.594	3.759	3.802	4.052	....	....	....	....
Norfolk	3.771	4.965	5.371	4.165	4.865	3.971	4.002	4.065	4.165	....	....	....	....
Chicago	3.25	4.20	5.231	3.60	4.65[17]	3.55	3.55	3.50	3.75	5.75	6.85	6.85	7.90
Milwaukee	3.387	4.337[3]	5.272[4]	3.737	4.787[17]	3.687	3.687	3.637	3.887	5.987	7.087	7.087	8.137
Cleveland	3.35	4.40	4.877[4]	3.60	4.45	3.40	3.588	3.35	3.75	5.956	7.056	6.85	7.90
Buffalo	3.35	4.40	4.75[4]	3.819	4.669	3.63	3.40	3.35	3.75	5.75	6.85	6.85	7.90
Detroit	3.45	4.50	5.00[4]	3.70	4.659[17]	3.609	3.661	3.45	3.80	6.08	7.18	7.159	8.209
Cincinnati	3.425	4.475[3]	4.825[5]	3.675	4.711	3.611	3.691	3.611	4.011	....	....	....	....
St. Louis	3.397	4.347[3]	5.172[4]	3.747	4.931[17]	3.697	3.697	3.647	4.031	6.131	7.231	7.231	8.281
Pittsburgh	3.35	4.40	4.75	3.60	4.45	3.40	3.40	3.35	3.75	5.75	6.85	6.85	7.90
St. Paul	3.51	4.46	5.257[4]	3.86	4.35[17]	3.81[13]	3.81[13]	3.76[13]	4.361	6.09	7.19	7.561	8.711
Omaha	3.865	5.443	5.608[4]	4.215	....	4.165	4.165	4.115	4.43	....	....	....	....
Indianapolis	3.58	3.58	4.568	4.918	3.768	4.78	3.63	3.58	3.98	6.08	7.18	7.18	8.23
Birmingham	3.45	....	4.75	3.70	....	3.55	3.55	3.50	4.43	....	....	....	....
Memphis	3.965[7]	4.66	3.265	4.215	....	4.065	4.065	4.015	4.33	....	....	....	....
New Orleans	4.058*	4.95	5.358	4.308	....	4.158	4.158*	4.108*	4.629	....	....	....	....
Houston	3.763	5.573	6.313[1]	4.313	....	4.25	4.25	3.75	6.373[3]	7.223	8.323	8.323	9.373
Los Angeles	5.00	7.20[3]	6.10[4]	4.95	5.613[15]	4.95	4.65	4.40	5.583	8.304	9.404	9.404	10.454
San Francisco	4.55[14]	7.30[4]	6.35[4]	4.50[14]	7.333[17]	4.65[14]	4.35[14]	4.15[14]	5.333	8.304	9.404	9.404	10.454
Seattle	4.65[12]	7.05[4]	5.95[4]	4.25[12]	....	4.75[12]	4.45[12]	4.35[12]	5.783	....	9.404	....	....
Portland	4.65[11]	6.60[4]	5.75[4]	4.75[11]	....	4.75[11]	4.45[11]	4.45[11]	5.533	8.304	9.404	8.304	9.404
Salt Lake City	4.53[17]	....	6.17[18]	5.53[17]	....	4.98[17]	4.98[17]	4.88[17]	5.90	....	....	....	....

NATIONAL EMERGENCY (N. E.) STEELS
(Hot Rolled Mill Extras for Alloy Content)

Designation	CHEMICAL COMPOSITION LIMITS, PER CENT								Basic Open-Hearth		Electric Furnace	
	Carbon	Manganese	Phosphorus Max.	Sulphur Max.	Silicon	Chromium	Nickel	Molybdenum	Bars and Bar-Strip	Billets, Blooms and Slabs	Bars and Bar-Strip	Billets, Blooms and Slabs
NE 1330	.28/ .33	1.60/1.90	.040	.040	.20/ .35	.....	.....	.....	.10c	$2.00	.....	.....
NE 1335	.33/ .38	1.60/1.90	.040	.040	.20/ .35	.....	.....	.....	.10	2.00	.....	.....
NE 1340	.38/ .43	1.60/1.90	.040	.040	.20/ .35	.....	.....	.....	.10	2.00	.....	.....
NE 1345	.43/ .48	1.60/1.90	.040	.040	.20/ .35	.....	.....	.....	.10	2.00	.....	.....
NE 1350	.48/ .53	1.60/1.90	.040	.040	.20/ .35	.....	.....	.....	.10	2.00	.....	.....
NE 8613	.12/ .17	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25¢	$25.00
NE 8615	.13/ .18	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8617	.15/ .20	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8620	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8630	.28/ .33	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8635	.33/ .38	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8637	.35/ .40	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8640	.38/ .43	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8642	.40/ .45	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8645	.43/ .48	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8650	.48/ .53	.75/1.00	.040	.040	.20/ .35	.40/ .60	.40/ .70	.15/ .25	.75	15.00	1.25	25.00
NE 8720	.18/ .23	.70/ .90	.040	.040	.20/ .35	.40/ .60	.40 .70	.20/ .30	.80	16.00	1.30	26.00
NE 9255	.50/ .60	.70/ .95	.040	.040	1.80/2.20	.....	.....	.....	.40	8.00	.....	.....
NE 9260	.55/ .65	.70/1.00	.040	.040	1.80/2.20	.....	.....	.....	.40	8.00	.....	.....
NE 9261	.55/ .65	.70/1.00	.040	.040	1.80/2.20	.10/ .25	.....	.....	.65	13.00	.....	.....
NE 9262	.55/ .65	.70/1.00	.040	.040	1.80/2.20	.25/ .40	.....	.....	.65	13.00	.....	.....
NE 9415	.13/ .18	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9420	.18/ .23	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9422	.20/ .25	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9425	.23/ .28	.80/1.10	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9430	.28/ .33	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9435	.33/ .38	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9437	.35/ .40	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9440	.38/ .43	.90/1.20	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.75	15.00	1.25	25.00
NE 9442	.40/ .45	1.00/1.30	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9445	.43/ .48	1.00/1.30	.040	.040	.20/ .35	.30/ .50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9450	.48/ .53	1.20/1.50	.040	.040	.20/ .35	.30/ 50	.30/ .60	.08/ .15	.80	16.00	1.30	26.00
NE 9537*	.35/ .40	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9540*	.38/ .43	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9542*	.40/ .45	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9545*	.43/ .48	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00
NE 9550*	.48/ .53	1.20/1.50	.040	.040	.40/ .60	.40/ .60	.40/ .70	.15/ .25	1.20	24.00	1.70	34.00

*Recommended for large sections only. Note: The extras shown are in addition to a base price of 2.70c. per 100 lb., on finished products and $54 per gross ton on semi-finished steel major basing points and are in cents per 100 lb. and dollars per gross ton in semi-finished. When acid open-hearth is specified and acceptable add to basic open hearth alloy differential 0.25c. per lb. for bars and bar strip, $5.00 per gross ton for billets, blooms and slabs. The ranges shown above are restricted to sizes 100 sq. in. or less or equivalent cross sectional area 18 in. wide or under with a max. individual piece weight of 7000 lb.

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT ROLLED: Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD ROLLED: Sheets, 400 to 1499 lb.; strip, extras on all quantities; bars, 1500 lb. base; NE alloy bars, 1000 to 39,999 lb.

EXCEPTIONS: (1) 150 to 499 lb. (2) 150 to 1499 lb. (3) 400 to 1499 lb. (4) 450 to 1499 lb. (5) 500 to 1499 lb. (6) 0 to 1999 lb. (7) 400 to 1999 lb. (8) 1000 to 1999 lb. (9) 450 to 3749 lb. (10) 400 to 3999 lb. (11) 300 to 4999 lb. (12) 300 to 10,000 lb. (13) 400 to 14,999 lb. (14) 400 lb. and over. (15) 1000 lb. and over. (16) 1500 lb. and over. (17) 2000 lb. and over. (18) 3500 lb. and over.

(a) Philadelphia: Galvanized sheets, 25 or more bundles.

Extra for size, quality, etc., apply on above quotations.

*Add 0.271c. for sizes not rolled in Birmingham.

**City of Philadelphia only. Applicable freight rates must be added to basing point prices to obtain delivered price to other localities in metropolitan area.

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)*

	Per Gross Ton
Old range, bessemer, 51.50	$4.75
Old range, non-bessemer, 51.50	4.60
Mesaba, bessemer, 51.50	4.60
Mesaba, non-bessemer, 51.50	4.45
High phosphorus, 51.50	4.35

*Adjustments are made to indicate prices based on variance of Fe content of ores as analyzed on a dry basis by independent laboratories.

FLUORSPAR

Maximum price f.o.b. consumer's plant $30 per short ton plus either (1) rail freight from producer to consumer, or (2) rail freight from Rosiclare, Ill., to consumer, whichever is lower.

Exception

When the WPB Steel Division certifies in writing the consumer's need for one of the higher grades of metallurgical fluorspar specified in the table below the price shall be taken from the table plus items (1 and 2) from paragraph above.

Effective CaF_2 Content:	*Base price per short ton*
70% or more	$33.00
65% but less than 70%	32.00
60% but less than 65%	31.00
Less than 60%	30.00

SEMI-FINISHED STEEL

Ingots, Carbon, Rerolling

Base per gross ton, f.o.b. mill.... $31.00
Exceptions: Phoenix Iron Co. may charge $38.75; Kaiser Co., $43.00 f.o.b. Pacific Coast Ports; Empire Sheet & Tinplate Co., $34.25.

Ingots, Carbon, Forging

Base per gross ton, f.o.b. Birmingham, Buffalo, Chicago, Cleveland, Gary, Pittsburgh, Youngstown $36.00
Exceptions: Phoenix Iron Co. may charge $43.00; Empire Sheet & Tinplate Co., $39.25, f.o.b. Mansfield, Ohio; West Coast producers, $48.00, f.o.b. Pacific Coast Ports.

Ingots, Alloy

Base per gross ton, f.o.b. Bethlehem, Buffalo, Canton, Coatesville, Chicago, Massillon, Pittsburgh $45.00
Exceptions: C/L delivered Detroit add $2.00; delivered East Michigan add $3.00. Connors Steel Co. may charge $45.00 f.o.b. Birmingham.

Billets, Blooms and Slabs

Pittsburgh, Chicago, Gary, Cleveland, Youngstown, Buffalo, Birmingham, Sparrows Point (rerolling only). Prices delivered Detroit are $2.00 higher; delivered E. Michigan, $3 higher; f.o.b. Duluth, billets only, $2.00 higher; billets f.o.b. Pacific ports are $12 higher. Delivered prices do not reflect three per cent tax on freight rates.

	Per Gross Ton
Rerolling	$34.00
Forging quality	40.00

For exceptions on semi-finished steel see the footnote on the page of finished steel prices.

Alloy Billets, Blooms, Slabs

Pittsburgh, Chicago, Canton, Massillon, Buffalo, or Bethlehem, per gross ton 54.00
Price delivered Detroit $2.00 higher; E. Michigan $3.00 higher.

Shell Steel

	Per Gross Ton
8 in. to 12 in.....	$52.00
12 in. to 18 in.....	54.00
18 in. and over.....	56.00

Basic open hearth shell steel, f.o.b. Pittsburgh, Chicago, Buffalo, Gary, Cleveland, Youngstown and Birmingham.
Prices delivered Detroit are $2.00 higher; E. Michigan, $3 higher.
Note: The above base prices apply on lots of 1000 tons of a size and section to which are to be added extras for chemical requirements, cutting, or quantity.

Sheet Bars

Pittsburgh, Chicago, Cleveland, Youngstown, Buffalo, Canton, Sparrows Point.

	Per Gross Ton
Open hearth or bessemer	$34.00

Skelp

Pittsburgh, Chicago, Youngstown, Coatesville, Pa., Sparrows Point, Md.

	Per Lb
Grooved, universal and sheared ...	1.90c.

Wire Rods

(*No. 5 to 9/32 in.*)

	Per Lb.
Pittsburgh, Chicago, Cleveland ...	2.00c.
Worcester, Mass.	2.10c.
Birmingham	2.00c.
San Francisco	2.50c.
Galveston	2.25c.

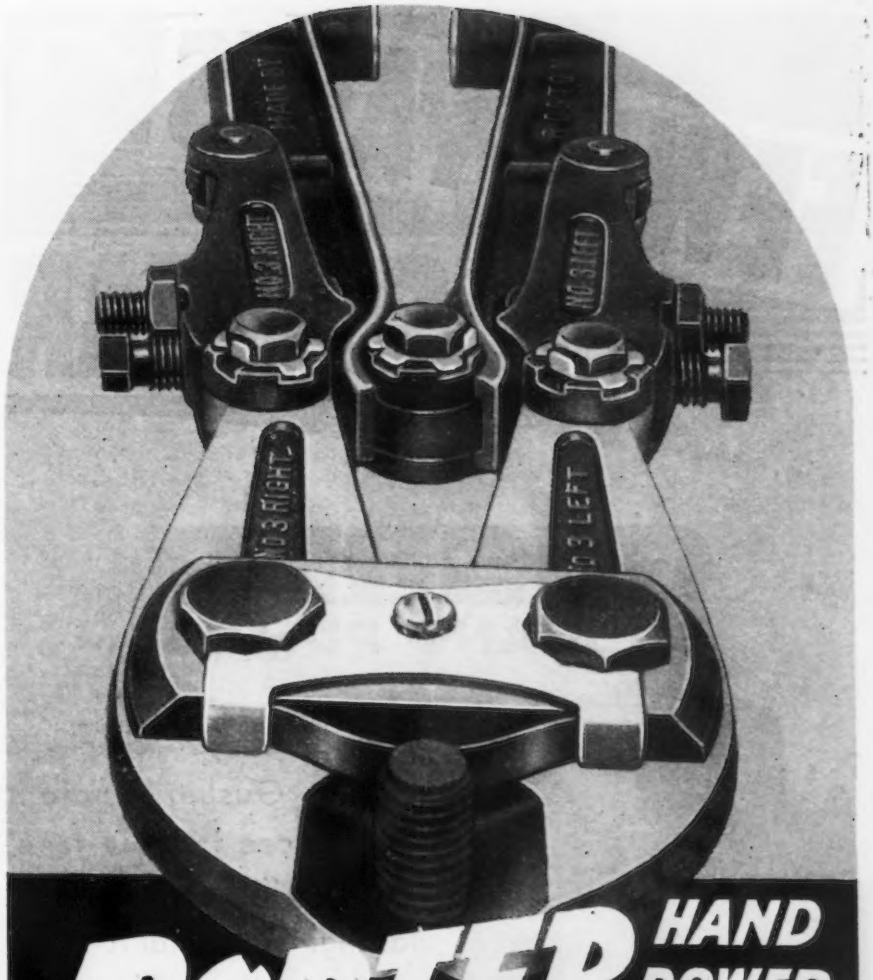
9/32 in. to 47/64 in., 0.15c. a lb. higher. Quantity extras apply.

TOOL STEEL

(*F.o.b. Pittsburgh, Bethlehem, Syracuse*)

	Base per lb.
High speed	67c.
Straight molybdenum	54c.
Tungsten-molybdenum	57½c.
High-carbon-chromium	43c.
Oil hardening	24c.
Special carbon	22c.
Extra carbon	18c.
Regular carbon	14c.

Warehouse prices east of Mississippi are 2c. a lb. higher; west of Mississippi 1c. higher.



PORTER HAND POWER CUTTERS

These tools go *to* the job and are used *on* the job independent of any power source — except a worker's two hands. This power is so multiplied that an average worker can exert sufficient pressure to "lift an elephant —."

This power delivered at the working head finds many applications in metal cutting and fabricating — emergency, repairs, on construction, shop or production.

The illustration above shows a Porter Bolt Clipper head cutting a 5/8" annealed bolt in the thread. In addition to standard tools for cutting wire, cable, chain, flat bars, splitting nuts, etc. there are special tools for Heading, Pressing, Crimping, Punching, Caulking.

FREE—Write for Free copy of Tool Maintenance Book—boiled down essence of practical experience in use and care of clippers, saws, chisels and other hand tools. A post card request will bring it postpaid. *Also write for catalog of Porter line of Cutters.*

H. K. PORTER, INC., 400 Ashland St., Everett 49, Mass.

PORTER HKP CUTTERS

FEWER PARTS LESS WEAR

GUSHER
COOLANT PUMPS

Because they're simple in design Gusher Coolant Pumps are trouble-free, highly efficient and long lasting. No metal-to-metal contacts, thus making continuous handling of grinding compounds possible. There's a type and model for your requirements. Write for complete new catalog.

★

Model 9040—Available in any current characteristics, including 25 cycle, 1, 2, or 3 phase. Totally enclosed 1/4 h. p. motor.

THE RUTHMAN MACHINERY CO.

1821 READING ROAD CINCINNATI 2, OHIO

The "Gusher" — A Modern Pump for Modern Machine Tools

PRICES

WELDED PIPE AND TUBING

Base Discounts, f.o.b. Pittsburgh District and Lorain, Ohio, Mills

(F.o.b. Pittsburgh only on wrought pipe)
Base Price—$200 per Net Ton

	Black	Galv.
Steel (Butt Weld)		
1/8 in.	63 1/2	51
1/4 in.	66 1/2	55
1/2 to 3 in.	68 1/2	57 1/2
Wrought Iron (Butt Weld)		
1/8 in.	24	3 1/2
1/4 in.	30	10
1/2 and 1 1/4 in.	34	16
1 1/2 in.	38	18 1/2
2 in.	37 1/2	18
Steel (Lap Weld)		
2 in.	61	49 1/2
2 1/2 and 3 in.	64	52 1/2
3 1/2 to 6 in.	66	54 1/2
Wrought Iron (Lap Weld)		
2 in.	30 1/2	12
2 1/2 to 3 1/2 in.	31 1/2	14 1/2
4 in.	33 1/2	18
4 1/2 to 8 in.	32 1/2	17
Steel (Butt, extra strong, plain ends)		
1/8 in.	61 1/2	50 1/2
1/4 in.	65 1/2	54 1/2
1/2 to 3 in.	67	57
Wrought Iron (Same as Above)		
1/8 in.	25	6
1/4 in.	31	12
1/2 to 2 in.	38	19 1/2
Steel (Lap, extra strong, plain ends)		
2 in.	59	48 1/2
2 1/2 and 3 in.	63	52 1/2
3 1/2 to 6 in.	66 1/2	56
Wrought Iron (Same as Above)		
2 in.	33 1/2	15 1/2
2 1/2 to 4 in.	39	22 1/2
4 1/2 to 6 in.	37 1/2	21

On butt weld and lap weld steel pipe jobbers are granted a discount of 5%. On less-than-carload shipments prices are determined by adding 25 and 30% and the carload freight rate to the base card.

F.o.b. Gary prices are two points lower discount or $4 a ton higher than Pittsburgh or Lorain on lap weld and one point lower discount, or $2 a ton higher on all butt weld.

CAST IRON WATER PIPE

Per Net Ton

6-in. and larger, del'd Chicago	$54.80
6-in. and larger, del'd New York	52.20
6-in. and larger, Birmingham	46.00
6-in. and larger f.o.b. cars, San Francisco or Los Angeles	69.40
6-in. and larger f.o.b. cars, Seattle	71.20

Class "A" and gas pipe, $3 extra; 4-in. pipe is $3 a ton above 6-in. Prices shown are for lots of less than 200 tons. For 200 tons or over, 6-in. and larger is $45 at Birmingham and $53.80 delivered Chicago, $59.40 at San Francisco and Los Angeles, and $70.20 at Seattle. Delivered prices do not reflect new 3 per cent tax on freight rates.

BOILER TUBES

Seamless Steel and Lap Weld Commercial Boiler Tubes and Locomotive Tubes, Minimum Wall. Net base prices per 100 ft. f.o.b. Pittsburgh, in carload lots.

	Seamless Cold Drawn	Seamless Hot Rolled	Lap Weld, Hot Rolled
2 in. o.d. 13 B.W.G.	15.03	13.04	12.38
2 1/2 in. o.d. 12 B.W.G.	20.21	17.54	16.58
3 in. o.d. 12 B.W.G.	22.48	19.50	18.35
3 1/2 in. o.d. 11 B.W.G.	28.37	24.62	23.15
4 in. o.d. 10 B.W.G.	35.20	30.54	28.66

(Extras for less carload quantities)

40,000 lb. or ft., and over	Base
30,000 lb. or ft. to 39,999 lb. or ft.	5%
20,000 lb. or ft. to 29,999 lb. or ft.	10%
10,000 lb. or ft. to 19,999 lb. or ft.	20%
5,000 lb. or ft. to 9,999 lb. or ft.	30%
2,000 lb. or ft. to 4,999 lb. or ft.	45%
Under 2,000 lb. or ft.	65%

PRICES

WIRE PRODUCTS

To the trade, f.o.b. Pittsburgh, Chicago, Cleveland, Birmingham, Duluth

	Basing Points Named	Pacific Coast Basing Points†
	Base per Keg	
Standard wire nails	$2.55	$3.05
Coated nails	2.55	3.05
Cut nails, carloads	3.85	....
	Base per 100 Lb.	
Annealed fence wire	$3.05	$3.55
Annealed galv. fence wire	3.40	3.90
	Base Column	
Woven wire fence*	$0.67	$0.85
Fence posts, carloads	.69	.86
Single loop bale ties	.59	.84
Galvanized barbed wire**	.70	.80
Twisted barbless wire	.70	....

*15½ gage and heavier. **On 80-rod spools in carload quantities.
†Prices subject to switching or transportation charges.

BOLTS, NUTS, RIVETS, SET SCREWS

Bolts and Nuts
(F.o.b. Pittsburgh, Cleveland, Birmingham or Chicago)

Machine and Carriage Bolts:

Base discount less case lots

	Per Cent Off List
½ in. & smaller x 6 in. & shorter	65½
9/16 & ⅝ in. x 6 in. & shorter	63½
¾ to 1 in. x 6 in. & shorter	61
1⅛ in. and larger, all lengths	59
All diameters over 6 in. long	59
Lag, all sizes	62
Plow bolts	65

Nuts, Cold Punched or Hot Pressed:
(Hexagon or Square)

½ in. and smaller	62
9/16 to 1 in. inclusive	59
1⅛ to 1½ in. inclusive	57
1⅝ in. and larger	56

On above bolts and nuts, excepting plow bolts, additional allowance of 10 per cent for full container quantities. There is an additional 5 per cent allowance for carload shipments.

Semi-Fin. Hexagon Nuts	U.S.S.	S.A.E.
Base discount less keg lots		
7/16 in. and smaller	..	64
½ in. and smaller	62	..
½ in. through 1 in.	..	60
9/16 in. to 1 in.	59	..
1⅛ in. through 1½ in.	57	58
1⅝ in. and larger	56	..

In full keg lots, 10 per cent additional discount.

Stove Bolts

	Consumer
Packages, nuts loose	71 and 10
In packages, with nuts attached	71
In bulk	80

On stove bolts freight allowed up to 65c. per 100 lb. based on Cleveland Chicago, New York on lots of 200 lb. or over.

Large Rivets
(½ in. and larger)

	Base per 100 lb.
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	$3.75

Small Rivets
(7/16 in. and smaller)

	Per Cent Off List
F.o.b. Pittsburgh, Cleveland Chicago, Birmingham	65 and 5

Cap and Set Screws

	Consumer Per Cent Off List
Upset full fin. hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in.	64
Upset set screws, cup and oval points	71
Milled studs	46
Flat head cap screws, listed sizes	36
Fillister head cap, listed sizes	51

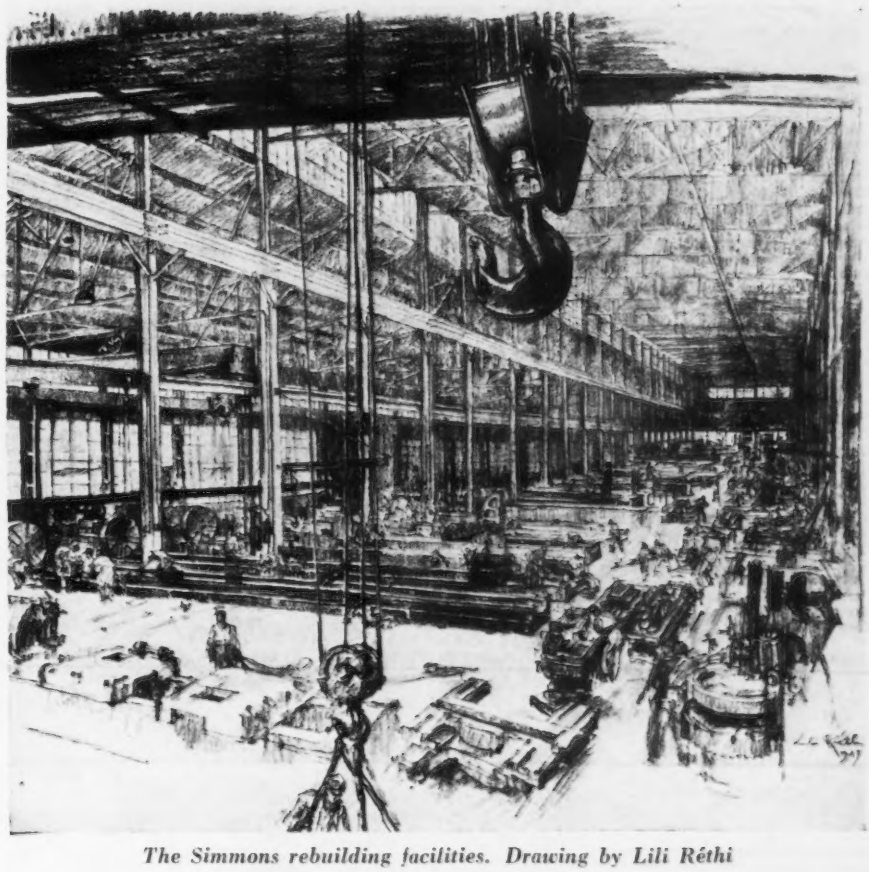
Freight allowed up to 65c. per 100 lb. based on Cleveland, Chicago or New York on lots of 200 lb. or over.

ROOFING TERNE PLATE

(F.o.b. Pittsburgh, 112 Sheets)

	20x14 in.	20x28 in.
8-lb. coating I.C.	$6.00	$12.00
15-lb. coating I.C.	7.00	14.00
20-lb. coating I.C.	7.50	15.00

Send it to . . REBUILDING HEADQUARTERS



The Simmons rebuilding facilities. Drawing by Lili Réthi

Why Rebuild Your Metal-Working Equipment Now

In recent years many of your machine tools have undergone punishing wear and tear. Operated the clock around, often in semi-skilled hands and with a minimum of maintenance, they are probably on the "ragged edge." Now is the time to return them to peak efficiency, stepping up your Victory pace and preparing for peacetime manufacture.

How Engineered Rebuilding Solves Maintenance Problems

Machine-tool reconditioning is a science at Simmons. *Engineered Rebuilding* accords each machine the following treatment:

It is completely dismantled to the main castings and pressure-cleaned.

All worn or broken parts that affect the operation of the machine are renewed. Sliding surfaces are renewed and ground or scraped, as required. Worn shafts or bearings are replaced or re-surfaced, as required.

It is re-assembled along the lines followed by the original manufacturer and tested under power before your inspector.

Simmons Offers Unparalleled Facilities and Experience

During the last thirty-five years, Simmons Engineers and mechanics have dismantled and rebuilt every type of machine tool manufactured. The largest and heaviest of equipment can be handled comfortably in our two spacious modern plants. That's why the world's leading industries call Simmons "Rebuilding Headquarters."

Consult us today without obligation

SIMMONS ENGINEERED Machine Tool REBUILDING

SIMMONS MACHINE TOOL CORP.
1721 NORTH BROADWAY, ALBANY 1, NEW YORK
NEW YORK CITY OFFICE: 149 BROADWAY

PIG IRON

All prices set in bold face type are maxima established by OPA on June 24, 1941. Other domestic prices (in italics) are delivered quotations per gross ton computed on the basis of the official maxima. Delivered prices do not reflect 3 per cent tax on freight rates.

	No. 2 Foundry	Basic	Bessemer	Malleable	Low Phosphorus	Charcoal
Boston	*$25.50*	*$25.00*	*$26.50*	*$26.00*	.....	.....
Brooklyn	*27.50*	*27.00*	.....	*28.00*	.....	.....
Jersey City	*26.53*	*26.03*	*27.53*	*27.03*	.....	.....
Philadelphia (4)	*25.84*	*25.34*	*26.84*	*26.34*	*$30.74*	.....
Bethlehem, Pa.	25.00	24.50	26.00	25.50	.....	.....
Everett, Mass.	25.00	24.50	26.00	25.50	.....	.....
Swedeland, Pa.	25.00	24.50	26.00	25.50	.....	.....
Steelton, Pa.	.....	24.50	.....	.....	29.50	.....
Birdsboro, Pa. (3)	25.00	24.50	26.00	25.50	29.50	.....
Sparrows Point, Md.	25.00	24.50	.....	.....	.....	.....
Erie, Pa.	24.00	23.50	25.00	24.50	.....	.....
Neville Island, Pa.	24.00	23.50	24.50	24.00	.....	.....
Sharpsville, Pa. (1)	24.00	23.50	24.50	24.00	.....	.....
Buffalo	24.00	23.50	25.00	24.50	29.50	.....
Cincinnati, Ohio	*25.11*	*24.61*	.....	*25.11*	.....	.....
Canton, Ohio	*25.39*	*24.89*	*25.89*	*25.39*	*32.69*	.....
Mansfield, Ohio	*25.94*	*25.44*	*26.44*	*25.94*	*32.86*	.....
St. Louis	*24.50*	*24.50*	.....	.....	.....	.....
Chicago	24.00	23.50	24.50	24.00	*35.46*	.....*$37.34*
Granite City, Ill.	24.00	23.50	24.50	24.00	.....	.....
Cleveland	24.00	23.50	24.50	24.00	*32.42*	.....
Hamilton, Ohio	24.00	23.50	.....	24.00	.....	.....
Toledo	24.00	23.50	24.50	24.00	.....	.....
Youngstown	24.00	23.50	24.50	24.00	*32.42*	.....
Detroit	24.00	23.50	24.50	24.00	.....	.....
Lake Superior fc.	.....	.....	.....	.....	.....	34.00
Lyles, Tenn. fc. (2)	.....	.....	.....	.....	.....	33.00
St. Paul	*26.63*	26.13	*27.13*	*26.63*	*39.80*	.....
Duluth	24.50	24.00	25.00	24.50	.....	.....
Birmingham	20.38	19.00	25.00	.....	.....	.....
Los Angeles	*26.95*	.....	.....	.....	.....	.....
San Francisco	*26.95*	.....	.....	.....	.....	.....
Seattle	*26.95*	.....	.....	.....	.....	.....
Provo, Utah	22.00	21.50	.....	.....	.....	.....
Montreal	*27.50*	*27.50*	.....	*28.00*	.....	.....
Toronto	*25.50*	*25.50*	.....	*26.00*	.....	.....

GRAY FORGE IRON: Valley or Pittsburgh furnace $23.50

(1) Pittsburgh Coke & Iron Co. (Sharpsville, Pa., furnace only) and the Struthers Iron and Steel Co., Struthers, Ohio, may charge 50c. a ton in excess of basing point prices for No. 2 foundry, basic, bessemer and malleable. Struthers Iron and Steel Co. may add another $1.00 per gross ton for iron from Struthers, Ohio, plant.

(2) Price shown is for low-phosphorous iron; high phosphorous sells for $28.50 at the furnace.

(3) E. & G. Brooke Co. Birdsboro, Pa., permitted to charge $1.00 per ton extra.

(4) Pittsburgh Ferromanganese Co. (Chester furnace only) may charge $2.25 a ton over maximum basing point prices.

Basing point prices are subject to switching charges; Silicon differentials (not to exceed 50c. a ton for each 0.25 per cent silicon content in excess of base grade which is 1.75 to 2.25 per cent); Phosphorus differentials, a reduction of 38c. per ton for phosphorus content of 0.70 per cent and over; Manganese differentials, a charge not to exceed 50c. per ton for each 0.50 per cent manganese content in excess of 1.00 per cent. Effective March 3, 1943, $2 per ton extra may be charged for 0.5 to 0.75 per cent nickel content and $1 per ton extra for each additional 0.25 per cent nickel.

METAL POWDERS

Prices are based on current market prices of ingots plus a fixed figure. F.o.b. shipping point, c. per lb., ton lots.

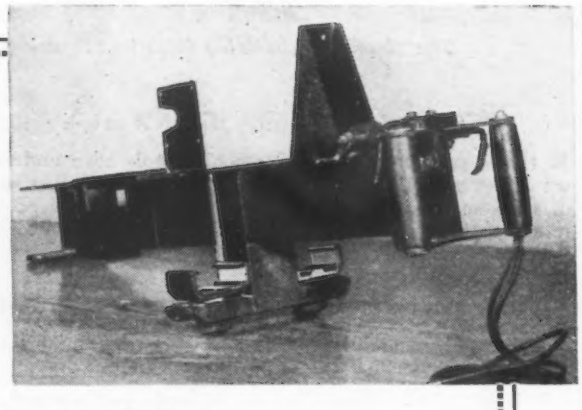
Copper, electrolytic, 150 and 200 mesh	21⅛ to 23½c.
Copper, reduced, 150 and 200 mesh	20½ to 25½c.
Iron, commercial, 100 and 200 mesh, 96 + % Fe	13½ to 15c.
Iron, crushed, 200 mesh and finer, 90 + % Fe	4c.
Iron, hydrogen reduced, 300 mesh and finer, 98½ + % Fe	63c.
Iron, electrolytic, unannealed, 300 mesh and coarser, 99 + % Fe	30 to 33c.
Iron, electrolytic, annealed minus 100 mesh, 99 + % Fe	42c.
Iron, carbonyl, 300 mesh and finer, 98-99.8 + % Fe	90c.
Aluminum, 100 and 200 mesh	*23 to 27c.
Antimony, 100 mesh	20.6c.
Cadmium, 100 mesh	$1
Chromium, 150 mesh	$1.03
Lead, 100, 200 & 300 mesh,	11½ to 12½c.
Manganese, 150 mesh	51c.
Nickel, 150 mesh	51½c.
Solder powder, 100 mesh, 8½c. plus metal	
Tin, 100 mesh	58¾c.
Tungsten metal powder, 98%-99%, any quantity, per lb.	$2.60
Molybdenum power, 99%, in 200-lb. kegs, f.o.b. York, Pa., per lb.	$2.60
Under 100 lb.	$3.00

*Freight allowed east of Mississippi.

COKE

Furnace, beehive (f.o.b. oven)	Net Ton
Connellsville, Pa.	$7.00*
Foundry, beehive (f.o.b. oven)	
Fayette Co., W. Va.	8.10
Connellsville, Pa.	8.25
Foundry, By-Product	
Chicago, del'd	13.35
Chicago, f.o.b.	12.60
New England, del'd	14.25
Kearny, N. J., f.o.b.	12.65
Philadelphia, del'd	12.88
Buffalo, del'd	13.00
Portsmouth, Ohio, f.o.b.	11.10
Painesville, Ohio, f.o.b.	11.75
Erie, del'd	12.75
Cleveland, del'd	12.80
Cincinnati, del'd	12.85
St. Louis, del'd	13.85
Birmingham, del'd	10.50

*Hand drawn ovens using trucked coal permitted to charge $7.75 per ton plus transportation charges. **Mo., Ala., and Tenn. producers—$13.35.



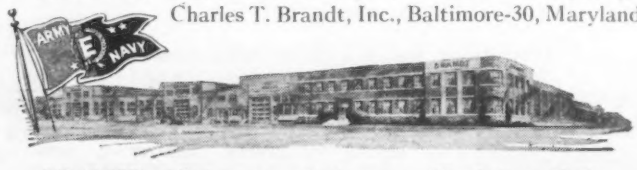
GUN ADAPTER, for synchronizing machine guns and aerial camera . . . built by Brandt of high-tensile stainless steel . . . by stamping and welding processes . . . for use on Martin Marauders.

Small Parts or Big Installations—

Call **BRANDT of Baltimore**

for Precision in Heavy Plate and Sheet Steel Work

Here is an 8½ acre plant . . . with the most modern equipment for shearing, rolling, forming, welding and completely fabricating ferrous, non-ferrous and alloy metals to your specifications . . . from the lightest gauge up to and including 1¼" mild steel or ¾" armor plate. Extensive war contracts necessarily limit our present acceptance of new business for immediate delivery. For information, address: Charles T. Brandt, Inc., Baltimore-30, Maryland.



BRANDT of Baltimore—*Craftsmen in Metal Since 1890*

PRICES

REFRACTORIES
(F.o.b. Works)

Fire Clay Brick	*Per 1000*
Super-duty brick, St. Louis	$64.60
First quality, Pa., Md., Ky., Mo., Ill.	51.30
First quality, New Jersey	56.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	46.55
Second quality, New Jersey	51.00
No. 1, Ohio	43.00
Ground fire clay, net ton	7.60
Silica Brick	
Pennsylvania and Birmingham	$51.30
Chicago District	58.90
Silica cement, net ton (Eastern)	9.00
Chrome Brick	*Per Net Ton*
Standard, chemically bonded, Balt., Plymouth Meeting, Chester	$54.00
Magnesite Brick	
Standard, Balt. and Chester	$76.00
Chemically bonded, Baltimore	65.00
Grain Magnesite	
Domestic, f.o.b. Balt. and Chester in sacks (carloads)	$43.43
Domestic, f.o.b. Chewelah, Wash. (in bulk)	22.00

RAILS, TRACK SUPPLIES
(F.o.b. Mill)

Standard rails, heavier than 60 lb., No. 1 O.H., gross ton	$40.00
Angle splice bars, 100 lb.	2.70
(F.o.b. Basing Points)	*Per Gross Ton*
Light rails (from billets)	$40.00
Light rails (from rail steel)	39.00
	Base per Lb.
Cut spikes	3.00c.
Screw spikes	5.15c.
Tie plates, steel	2.15c.
Tie plates, Pacific Coast	2.30c.
Track bolts	4.75c.
Track bolts, heat treated, to railroads	5.00c.
Track bolts, jobbers discount	63-5

Basing points, light rails, Pittsburgh, Chicago, Birmingham; cut spikes and tie plates—Pittsburgh, Chicago, Portsmouth, Ohio, Weirton, W. Va., St. Louis, Kansas City, Minnequa, Colo., Birmingham and Pacific Coast ports; tie plates alone—Steelton, Pa., Buffalo. Cut spikes alone—Youngstown, Lebanon, Pa., Richmond, Oregon and Washington ports, add 25c.

CORROSION AND HEAT-RESISTING STEEL
(Per lb. base price, f.o.b. Pittsburgh)

Chromium-Nickel Alloys

	No. 304	No. 302
Forging billets	21.25c.	20.40c.
Bars	25.00c.	24.00c.
Plates	29.00c.	27.00c.
Structural shapes	25.00c.	24.00c.
Sheets	36.00c.	34.00c.
Hot rolled strip	23.50c.	21.50c.
Cold rolled strip	30.00c.	28.00c.
Drawn wire	25.00c.	24.00c.

Straight-Chromium Alloys

	No. 410	No. 430	No. 442	No. 446
F.Billets	15.725c.	16.15c.	19.125c.	23.375c.
Bars	18.50c.	19.00c.	22.50c.	27.50c.
Plates	21.50c.	22.00c.	25.50c.	30.50c.
Sheets	26.50c.	29.00c.	32.50c.	36.50c.
Hot strip	17.00c.	17.50c.	24.00c.	35.00c.
Cold strip	22.00c.	22.50c.	32.00c.	52.00c.

Chromium-Nickel Clad Steel (20%)

	No. 304
Plates	18.00c.*
Sheets	19.00c.

*Includes annealing and pickling

ELECTRICAL SHEETS
(Base, f.o.b. Pittsburgh)

	Per Lb.
Field grade	3.20c.
Armature	3.55c.
Electrical	4.05c.
Motor	4.95c.
Dynamo	5.65c.
Transformer 72	6.15c.
Transformer 65	7.15c.
Transformer 58	7.65c.
Transformer 52	8.45c.

F.o.b. Granite City, add 10c. per 100 lb. on field grade to and including dynamo. Pacific ports add 75c. per 100 lb. on all grades.

Stearns ROAD Sweeping MAGNETS

Conservation of tires by efficient, automatic collection of scrap metal on streets, highways, parking lots, in shops and for large areas is most economically done with Stearns Road Sweeping Magnets.

This is only one of many Stearns magnet applications. We make magnets in all sizes and shapes.

Consult us on your magnet requirements whether for lifting, separation or other purposes. Ask for our magnet catalog.

FOR FAST, EFFICIENT, LOW COST MOVING OF SHEETS, RAILS, BILLETS, ETC.

Stearns MAGNETIC MFG. CO.

SEPARATORS DRUMS ROLLS CLUTCHES BRAKES PULLEYS

635 S. 28th St. Milwaukee 4, Wis.

You Can Weld Cast Iron with the Electric Arc This Book Tells How

Send for your copy TODAY

ELECTRIC arc welding is a quick, economical and reliable process for reclaiming iron castings that are broken, worn or defective. Slow and costly preheating is not necessary —and arc welds that are fully machinable, even through the line of fusion, can be made.

Our complete line of electrodes for welding cast iron gives you a wide choice of materials and processes for this work. They are all described in the working manual illustrated above, which is entirely devoted to the arc welding of cast iron. If you make, machine or use iron castings, you need this book.

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MANUFACTURERS AND DISTRIBUTORS OF WELDING ELECTRODES AND SPECIALTIES

How many WORDS in a speech?

Usually too many, we think. We're not very long on words here at Dunbar's. Springmaking is our business and we prefer to stick to it. We'd rather show you how your spring may be improved, perhaps at lower cost—or possibly at savings in assembly time. We like to work on new spring developments, too. It's sort of a hobby with us.

Good spring action speaks louder than words!

DUNBAR SPRINGMAKERS

SPRINGS WIRE FORMS SMALL STAMPINGS

DUNBAR BROS. CO., Bristol, Conn.
Division of Associated Spring Corporation

PRICES

Ferromanganese

78-82% Mn, maximum contract base price per gross ton, lump size, f.o.b. car at Baltimore, Bethlehem, Philadelphia, New York, Birmingham, Rockdale, Rockwood, Tenn.

Carload lots (bulk)	$135.00
Carload lots (packed)	141.00
Less ton lots (packed)	148.50

Premium, $1.70 for each 1% above 82% Mn; penalty, $1.70 for each 1% below 78%.

Manganese Metal

Contract basis, lump size, per lb of metal, f.o.b. shipping point with freight allowed. Spot sales add 2c. per lb.

96-98% Mn, .2% max. C, 1% max. Si, 2% max. Fe.

Carload, bulk	36c.
L.c.l. lots	38c.

95-97% Mn, .2% max. C, 1.5% max. Si, 2.5% max. Fe.

Carload, bulk	34c.
L.c.l. lots	35c.

Spiegeleisen

Maximum base, contract prices, per gross ton, lump, f.o.b. Palmerton, Pa.

	16-19% Mn 3% max. Si	19-21% Mn 3% max. Si
Carloads	$35.00	$36.00
Less ton	47.50	48.50

Electric Ferrosilicon

OPA maximum base price cents per lb. contained Si, lump size in carlots, f.o.b. shipping point with freight allowed to destination.

	Eastern Zone	Central Zone	Western Zone
50% Si	6.65c.	7.10c.	7.25c.
75% Si	8.05c.	8.20c.	8.75c.
80-90% Si	8.90c.	9.05c.	9.55c.
90-95% Si	11.05c.	11.20c.	11.65c.

Spot sales add: .45c per lb. for 50% Si, .3c. per lb. for 75% Si, .25c. per lb. for 80-90% and 90-95% Si.

Silvery Iron

(Per Gross Ton, base 6.00 to 6.50 Si)

F.o.b. Jackson, Ohio	$29.50*
Buffalo	30.75*

For each additional 0.50% silicon add $1 a ton. For each 0.50% manganese over 1% add 50c. a ton. Add $1 a ton for 0.75% phosphorous or over.

*OPA price established 6-24-41.

Bessemer Ferrosilicon

Prices are $1 a ton above silvery iron quotations of comparable analysis.

Silicon Metal

OPA maximum base price per lb. of contained Si, lump size, f.o.b. shipping point with freight allowed to destination. for l.c.l. above 2000 lb., packed. Add .25c. for spot sales.

	Eastern Zone	Central Zone	Western Zone
96% Si, 2% Fe.	13.10c.	13.55c.	16.50c.
97% Si, 1% Fe.	13.45c.	13.90c.	16.80c.

Ferrosilicon Briquets

OPA maximum base price per lb. of briquet, bulk, f.o.b. shipping point with freight allowed to destination. Approximately 40% Si. Add .25c. for spot sales.

	Eastern Zone	Central Zone	Western Zone
Carload, bulk	3.35c.	3.50c.	3.65c.
2000 lb.-carload	3.8c.	4.2c.	4.25c.

Silicomanganese

Contract basis lump size, per lb. of metal, f.o.b. shipping point with freight allowed. Add .25c. for spot sales. 65-70% Mn, 17-20% Si, 1.5% max. C.

Carload, bulk	6.05c.
2000 lb. to carload	6.70c.
Under 2000 lb.	6.90c.
Briquets, contract, basis carlots, bulk freight allowed, per lb.	5.80c.
2000 lb. to carload	6.30c.
Less ton lots	6.55c.

Ferrochrome

(65-72% Cr, 2% max. Si)

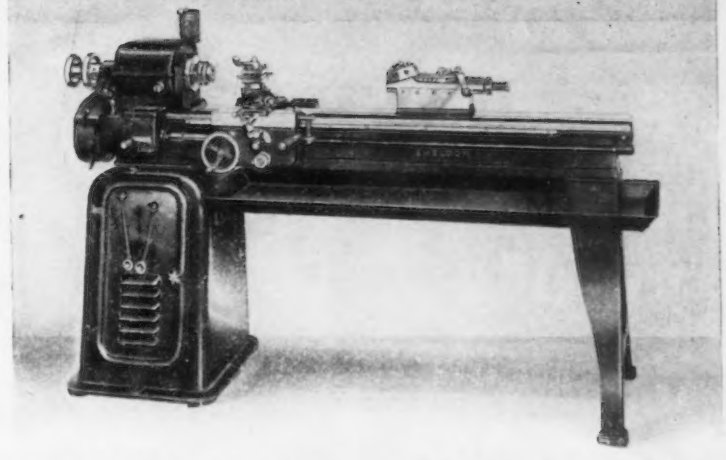
OPA maximum base contract prices per lb. of contained Cr, lump size in carload lots, f.o.b. shipping point, freight allowed to destination. Add .25c. per lb. contained Cr for spot sales.

	Eastern Zone	Central Zone	Western Zone
0.06% C	23.00c.	23.40c.	24.00c.
0.10% C	22.50c.	22.90c.	23.50c.
0.15% C	22.00c.	22.40c.	23.00c.
0.20% C	21.50c.	21.90c.	22.50c.
0.50% C	21.00c.	21.40c.	22.00c.
1.00% C	20.50c.	20.90c.	21.50c.
2.00% C	19.50c.	19.90c.	21.00c.
66-71% Cr, 4-10% C	13.00c.	13.40c.	14.00c.

Other Ferroalloys

Ferrotungsten, Standard grade, lump or ¼X down, packed, f.o.b. plant at Niagara Falls, New York, Washington, Pa., York, Pa., per lb. contained tungsten. 10,000 lb. of more.	**$1.90**
Ferrovanadium, 35-55%, contract basis, f.o.b. producer's plant, usual freight allowances, per lb. contained Va.	
Open Hearth	$2.70
Crucible	$2.80
Primos	$2.90
Cobalt, 97% min., keg packed, contract basis, f.o.b. producer's plant, usual freight allowances, per lb. of cobalt metal	**$1.50**
Vanadium pentoxide, 88%-92% V_2O_5 technical grade, contract basis, any quantity, per lb. contained V_2O_5. Spot sales add 5c. per lb. contained V_2O_5	**$1.10**
Ferroboron, contract basis, 17.50% min. Bo, f.o.b. producer's plant with usual freight allowances, per lb. of alloy.	
2000 lb. to carload	$1.20
Under 2000 lb.	1.30
Per lb. alloy	$1.20
Ton lots	$1.25
Silcaz No. 3, contract basis, f.o.b. producer's plant with usual freight allowances, per lb. of alloy. (Pending OPA approval)	
Carload lots	25c.
2000 lb. to carload	26c.
Silvaz No. 3, contract basis, f.o.b. producer's plant with freight allowances, per lb. of alloy (Pending OPA approval)	
Carload lots	58c.
2000 lb. to carload	59c.
Grainal, f.o.b. Bridgeville, Pa., freight allowed 50 lb. and over, max. based on rate to St. Louis	
No. 1	87.5c.
No. 6	60c.
No. 79	45c.
Bortram, f.o.b. Niagara Falls	
Ton lots, per lb.	45c.
Less ton lots, per lb.	50c.
Ferrocolumbium, 50-60%, contract basis, f.o.b. plant with freight allowances, per lb contained Cb.	
2000 lb. lots	$2.25
Under 2000 lb. lots	$2.30
Ferrotitanium, 40%-45%, f.o.b. 0.10c. max. Niagara Falls, N. Y., ton lots, per lb. contained Ti.	**$1.23**
Less ton lots	$1.25
Ferrotitanium, 20%-25%, 0.10 C max., ton lots, per lb. contained titanium	**$1.35**
Less ton lots	$1.40
High-carbon ferrotitanium, 15%-20%, 6%-8% carbon, contract basis, f.o.b. Niagara Falls, N. Y., freight allowed East of Mississippi River, North of Baltimore and St. Louis, per carload	**$142.50**
Ferrophosphorus, 18% electric or blast furnace, f.o.b. Anniston, Ala., carlots, with $3 unitage freight equaled with Rockdale, Tenn., per gross ton	**$58.50**
Ferrophosphorus, electrolytic 23-26%, carlots, f.o.b. Monsanto (Siglo), Tenn., $3 unitage freight equalized with Nashville, per gross ton	**$75.00**
Ferromolybdenum, 55-75%, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained molybdenum	**95c.**
Calcium molybdate, 40%-45%, f.o.b. Langeloth and Washington, Pa., any quantity, per lb. contained Mo	**80c.**
Molybdenum oxide briquettes, 48%-52% Mo, f.o.b. Langeloth, Pa., per lb. contained Mo	**80c.**
Molybdenum oxide, in cans, f.o.b. Langeloth and Washington, Pa., per lb. contained Mo	**80c.**
Zirconium, 35-40%, contract basis, f.o.b. producer's plant with freight allowances, per lb. of alloy. Add ¼c. for spot sales	
Carload lots	14c.
Zirconium, 12-15%, contract basis, lump, f.o.b. plant with usual freight allowances, per lb. of alloy	
Carload, bulk	4.6c.
Alsifer (approx. 20% Al, 40% Si and 40% Fe), contract basis, f.o.b. Niagara Falls, carload, bulk	**5.75c.**
Ton lots	7.25c.
Simanal (approx. 20% Si, 20% Mn, 20% Al), contract basis, f.o.b. Philo, Ohio, with freight not to exceed St. Louis rate allowed, per lb.	
Car lots	8.75c.
Ton lots	9.25c.

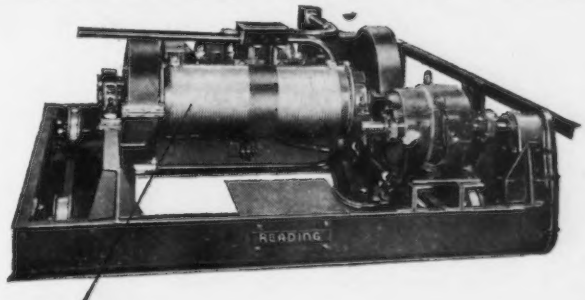
★ SHELDON ★



PRECISION TOOL ROOM AND PRODUCTION LATHES

BEST known as quality tool room lathes, SHELDON Precision Lathes are also ideally suited for much second operation and other production work because of their extra collet capacity, sturdy construction, accuracy and available production features including: Lever operated Bed Turret, or Tool Post Turrets, Lever operated Collet Attachments, Tailstocks, Double Tool Posts, 4-speed underneath motor drives, etc. If you are looking for a 10", 11" or 12" Precision Lathe for the Tool Room or Production Line, be sure to see the SHELDON Lathe before you order.

SHELDON MACHINE COMPANY, INC., 4240 N. KNOX AVE., CHICAGO 41, U.S.A.



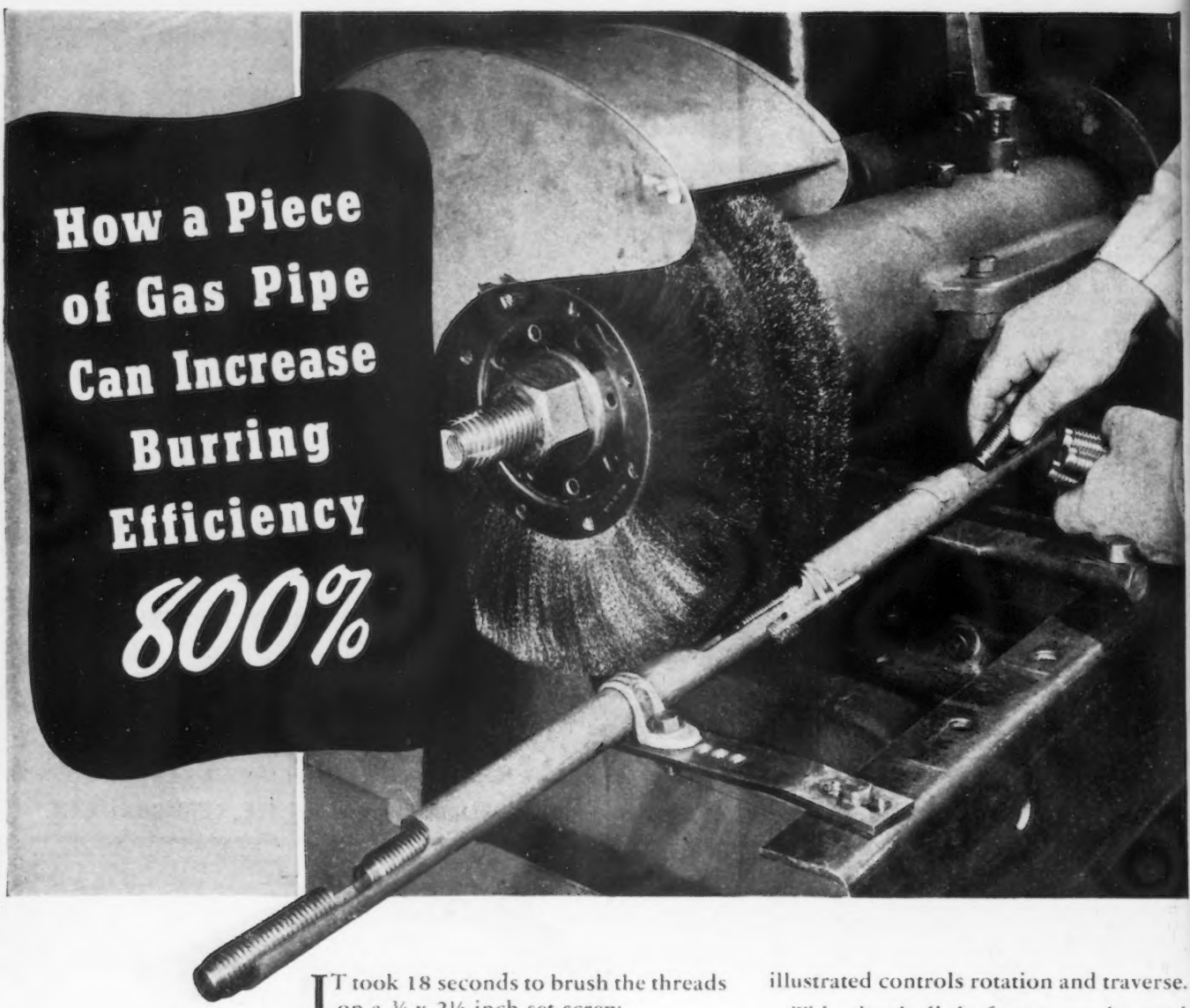
ON MAINTENANCE WITH **READING** CRANES

You save on maintenance costs with Reading Cranes because of the simple, easily accessible unit design. This permits easy removal from the hoist assembly of individual motors, drums or gear housings without disturbing other units or changing their alignment.

Other low maintenance features are: split gear cases to simplify maintenance, long life anti-friction bearings throughout, machined grooves on the drum to save cable wear and replacement. For full information on the long trouble-free performance of Reading Cranes, write for your copy of "The Why and How of Faster Production at Less Cost."

READING CHAIN HOISTS-ELECTRIC HOISTS OVERHEAD TRAVELING CRANES

READING CHAIN & BLOCK CORP. 2101 ADAMS ST., READING, PA.



IT took 18 seconds to brush the threads on a ¾ x 2½-inch set screw.

It can be done in 2 seconds.

That's 1800 per hour as against 200 . . . or a saving of an entire month's time on a run of 50,000.

An ordinary piece of gas pipe can make all that difference. Cut a slot in it and mount it in position before a battery of Osborn brushing wheels.

Instead of brushing each stud separately, the operator simply feeds the work in at one end of the gas pipe and the rotating motion of the brush spins and cleans the threads uniformly. A little stationary brush inserted through the pipe as illustrated controls rotation and traverse.

This simple little fixture can be used for burring and polishing many small cylindrical parts, threaded or smooth. It can be made of steel, fiber or plastic tubing, depending upon the nature of the work.

This is just one of many simple solutions that can speed up your production by the proper use of brushing wheels and simple fixtures, as proved in many plants by Osborn Brushing Analysis.

This famous fact-finding survey originated by Osborn has been necessarily curtailed due to wartime pressure. However, a limited O. B. A. service is available for specific operations on vital production.

THE OSBORN MANUFACTURING COMPANY
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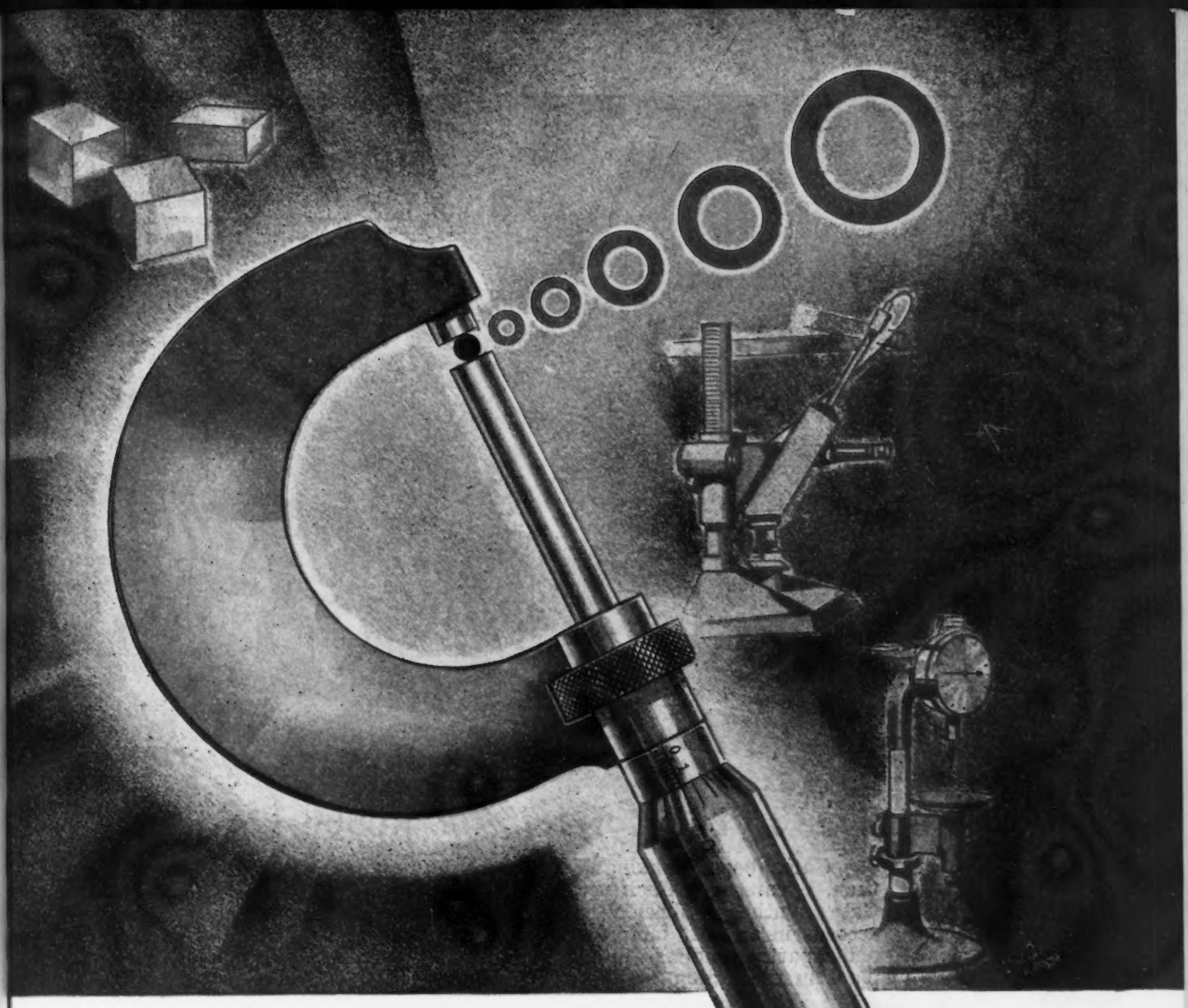
WORLD'S LARGEST MANUFACTURER OF BRUSHES FOR INDUSTRY

Osborn Brushes



Almost a Century of Know-How based on working "further back of the decimal point"

Planing 10-inch armor plate to + or −.002 or turning locomotive driving wheels to within .005 of roundness *on a production basis* calls for tools which combine extreme accuracy with advanced design and specialized engineering experience.

Sellers — since 1848 — has maintained its lead by constant improvement in design, and by taking advantage of the latest in measuring and calibrating instruments.

If you have a reputation for accurate work delivered on schedule, Sellers Machine Tools will help you maintain it... Glad to send you complete data on

HORIZONTAL BORING, DRILLING AND MILLING MACHINES

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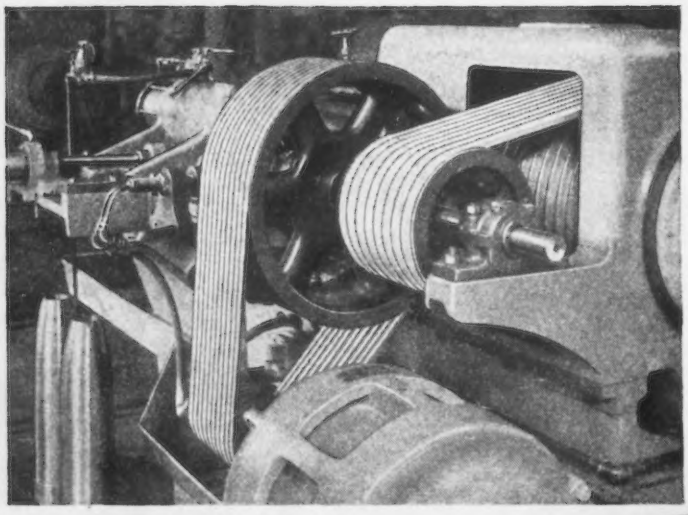
Precision Tools Since 1848



*Used in Many Industries

On this machine which profiles the outside of high-explosive shells, Gates V-Belts of special synthetic rubber are used because of their proved ability to withstand bad oil conditions. By actual records, on hundreds of installations where oil or heat conditions are severe, Gates special synthetic V-Belts are wearing 2 times to 3 times as long as any natural rubber belts ever used!

Widely Used* for Over 6 Years

GATES Synthetic Rubber V-Belts

–Have Proved *Superior*

Even to Belts of *Natural* Rubber!

Gates began making V-Belts entirely of synthetic rubber more than 6 years ago. Each year since then, thousands upon thousands of Gates synthetic rubber V-Belts have been making outstanding service records in aircraft factories, in steel mills, in ordnance plants, in machine parts factories—in fact, in practically every type of industrial plant in the nation.

This long *head-start* in the fabrication of synthetic rubber V-Belts was no accident. It was started deliberately, in peacetime and not under pressure of necessity. The synthetic rubber selected by Gates is a very *special* synthetic rubber—not in any sense merely a "substitute" for rubber. In certain very important applications it is *greatly superior* to natural rubber.

For example:—one special synthetic rubber selected by Gates has the unusual characteristic of withstanding oil and heat much better than even natural rubber. Where heat and oil conditions are especially severe, Gates special synthetic V-Belts are outwearing any natural rubber V-Belts by as much as 230%.

Of the very greatest importance to V-Belt users today is Gates' unusually long experience and success in making V-Belts of synthetic rubber. This is especially important now because the time has come when Gates' superior knowledge of synthetic rubber can be put to work for you right in your own plant.

You have only to look in your telephone directory and call the Gates Field Engineer. He will put at your service the full benefits of Gates' knowledge and experience without the slightest obligation.

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Engineering Offices and Stocks in All Large Industrial Centers

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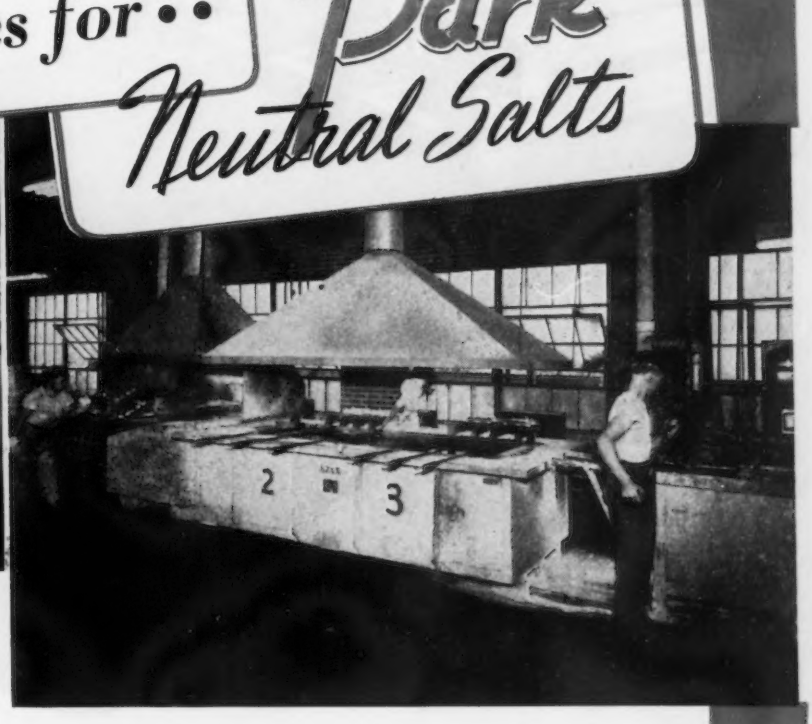
Industry finds wide variety of uses for •• Park Neutral Salts



★ *SMALL FURNACE—Neutral Salts used in hardening miscellaneous parts.*

★ *LARGE FURNACE—Fuse bodies and boosters hardened, quenched and drawn in salt baths.*

NEARLY EVERY DAY brings additions to the variety of parts heat-treated in neutral salt baths.

This trend was accelerated by the introduction of N.E. Steels, which require close temperature control and strict uniformity of heat treatment to produce the highest physical properties and maximum service performance.

Park's service metallurgists and research laboratory staff have rendered invaluable assistance to a large number of manufacturers by their development of proper salt baths and operating procedures.

The following parts are typical examples of parts heat treated by Park's neutral salt baths: Aircraft Parts, Automotive Parts, Tank Parts, Gun Parts, Truck Parts, Fuse Bodies and Boosters, Shells, Cartridge Cases, Gears, Hi-Speed and Carbon Tools, Screws, Bolts and Studs.

★ ★ ★

If you have a problem of heat treating any of the above, consult the Park Service Metallurgist in your territory—write or wire us direct.

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PARK CHEMICAL CO.
DETROIT . . . MICHIGAN

● Liquid and Solid Carburizers ☆ Cyanide, Neutral and High Speed Steel Salts ☆ Lead Pot Carbon ☆ Charcoal ☆ Coke ☆ No Carb. ☆ Carbon Preventer ☆ Quenching and Tempering Oils ☆ Drawing Salts ☆ Metal Cleaners ☆ Liquid Grain Cement

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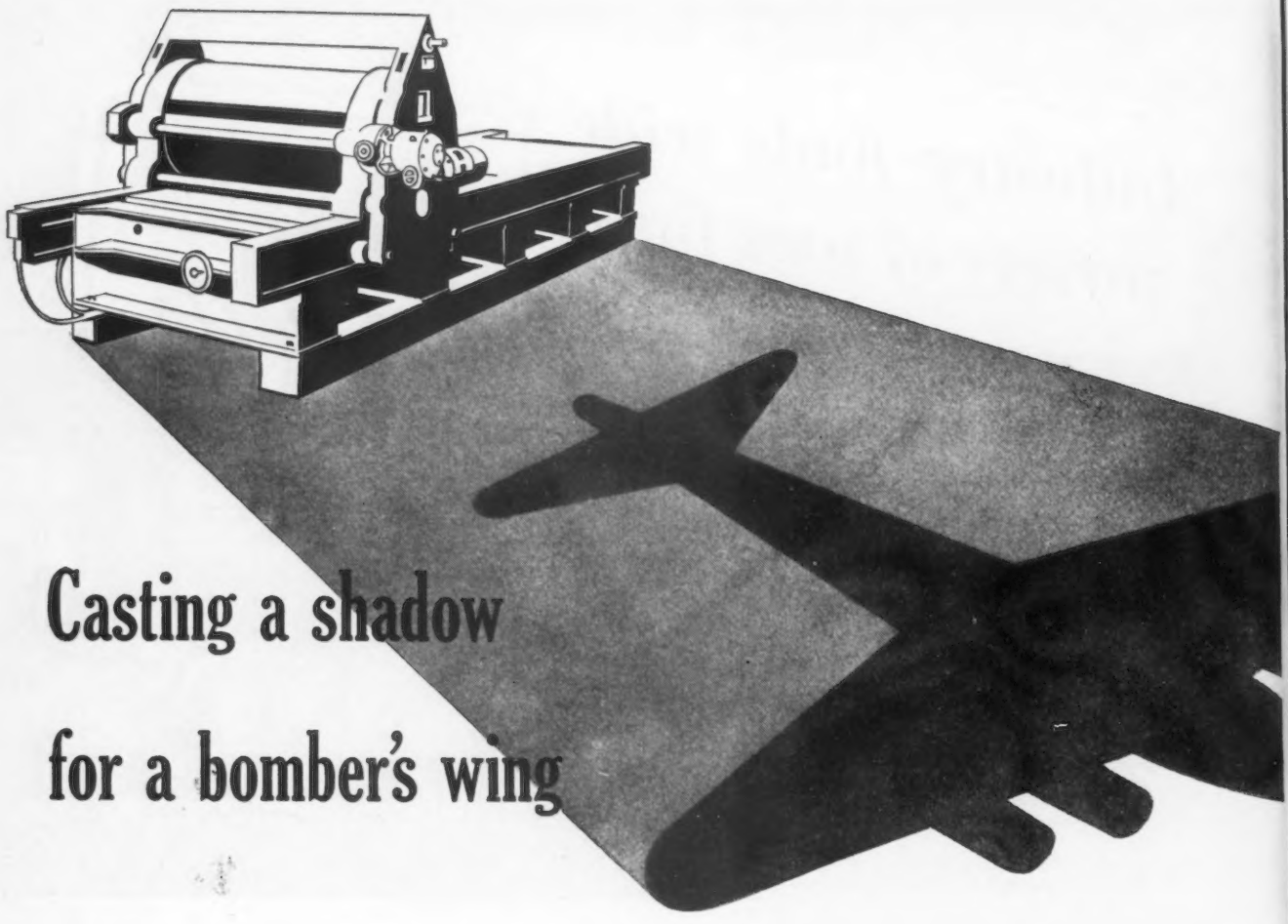

Casting a shadow for a bomber's wing

As a guide for cutting individual parts to exact shape and to locate drilling centers accurately, aircraft men use flat metal patterns called templates. As bomber size increased and parts became larger and larger, it became difficult to reproduce these templates—the size of the pieces crowded the limitations of cameras and lenses.

One aircraft production engineer wondered if giant templates could be made by a *metal proof press,* and went to Wagner Litho Machinery Company to find out. Normally Wagner builds more proving presses and related equipment for metal lithography than all other companies combined. They were used to specialized jobs—knew how to do them well.

That's why the first press they turned out for the aircraft company (even though a giant size) was so successful in reproducing templates accurately and by the hundreds. Since then, Wagner has built and installed many other such presses in aircraft plants and, in so doing, has helped to speed up airplane production.

This is an example of Wagner precision and skill, the kind of craftsmanship that has helped to solve the toughest problems involving transfer of designs onto metal, or other materials. If you have a war job or a peacetime project of this nature, Wagner engineers are available to help save your time and to obtain a better product.

★ ★ **WAGNER LITHO MACHINERY** *Company* ★ ★

Divisions of National-Standard Company

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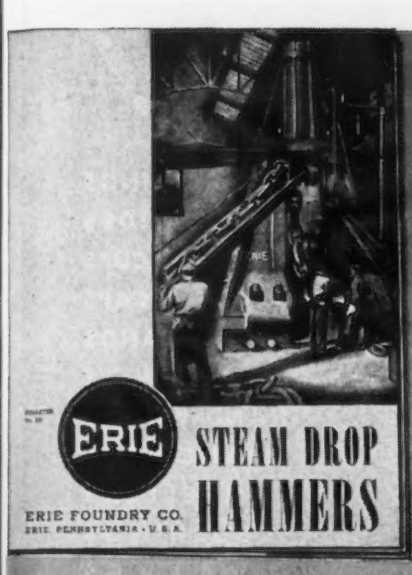

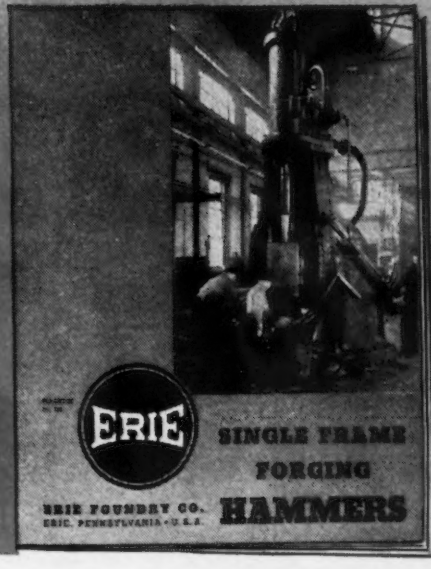

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BOOKLET 334 • Erie Hydraulic Presses for synthetic rubber and plastic products.

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ERIE BUILDS *Dependable* HAMMERS

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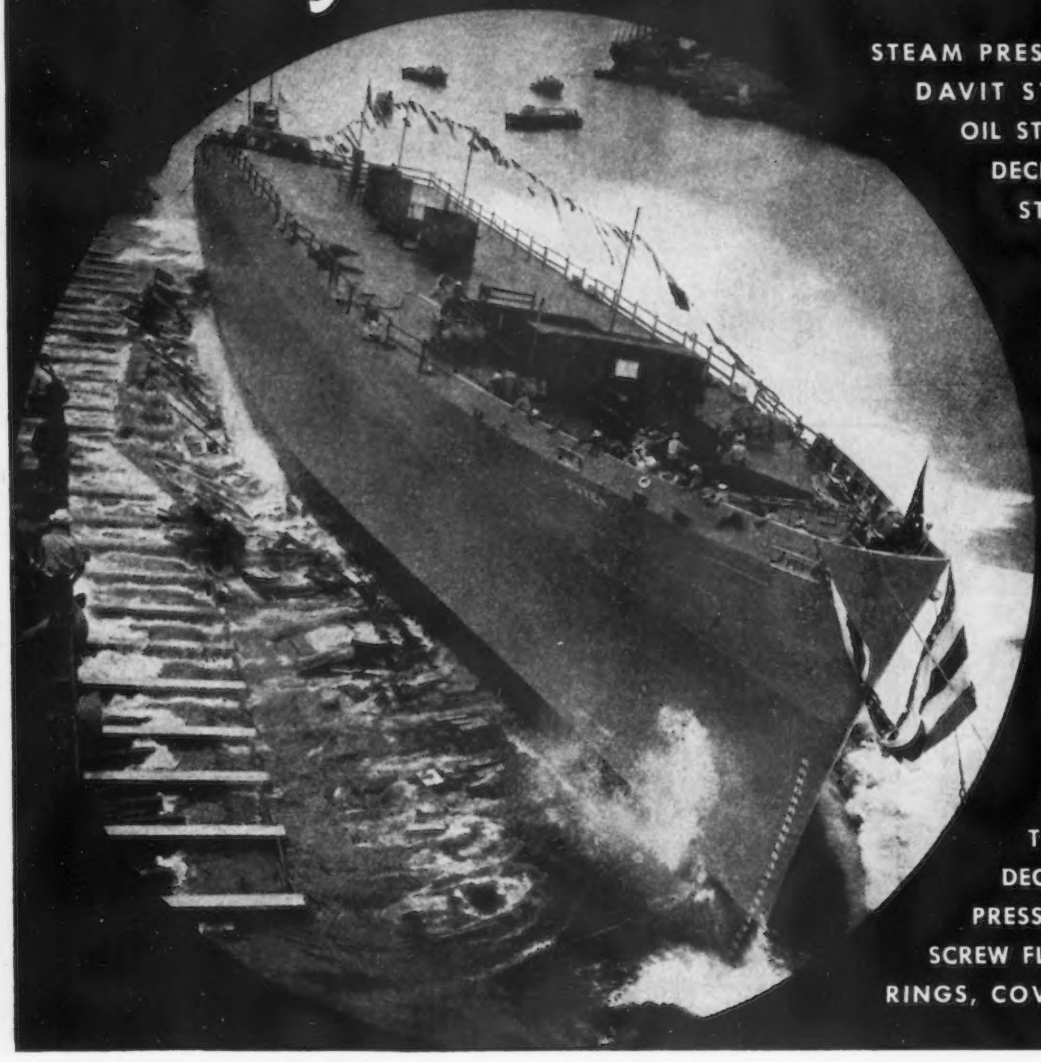

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OIL STRAINERS & CUPS
DECK PLATES & CAPS
STEERING STANDS
CAST HARDWARE
HAND WHEELS
STANCHIONS
IMPELLERS
BUSHINGS
VALVES
PUMPS
GEARS
CASINGS
HANDLES
BRACKETS
TURNBUCKLES
PUMP PISTONS
HINGES & LOCKS
EJECTOR NOZZLES
TARPAULIN CLEATS
DECK & HULL CASTINGS
PRESSURE PIPE FITTINGS
SCREW FLANGES & FITTINGS
RINGS, COVERS & GRATINGS

THE items listed above represent only a small fraction of the hundreds of parts where the use of brass or bronze is considered essential by naval architects, engineers, ship operators and manufacturers.

If you are casting parts of manganese bronze, Government "M", Navy "G" or any other analysis to meet a particular job, Federated is equipped to fill that need. Our technical skill, practical know-how and meticulous control assure products of dependable uniformity.

Consulting service through your nearest Federated office.

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ALUMINUM
BRASS
BRONZE
DIE CAST ALLOYS
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All of these in standard specifications. Special alloys to your order.

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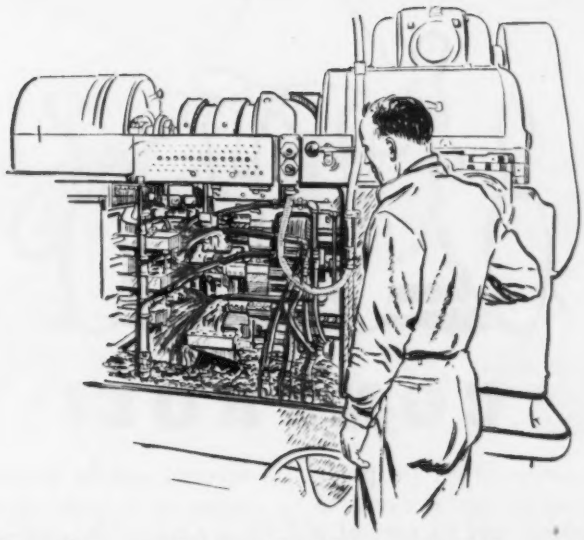
AMERICAN SMELTING and REFINING COMPANY

120 BROADWAY, NEW YORK (5) N. Y.

Nation-wide service with offices in principal cities



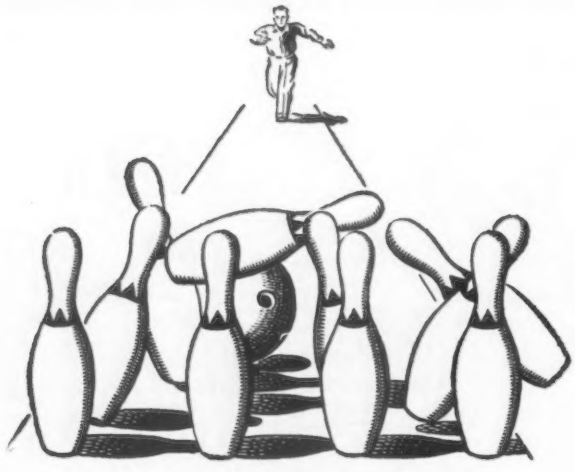
We Make No Other Claim Than This . . . "PERFECTED LUBEWELL" CUTTING COMPOUND WILL OUT-PERFORM ANY CUTTING OIL OR SOLUBLE EMULSION REGARDLESS OF THE MACHINE TOOL OR TYPE OF WORK BEING DONE

To prove this statement, G. Whitfield Richards will ship you any quantity of "Perfected Lubewell" and if you find that it does not: **1.** increase tool life up to 50%; **2.** increase production speed of the machine up to 25%; **3.** give a superior finish and hold to closer tolerances; **4.** lower cutting lubricant cost as much as 40%... you may tear up the bill. "Perfected Lubewell" is known from coast to coast as the one cutting compound for all machining operations, costing from 3 to 9 cents per gallon in the machine.

G. WHITFIELD RICHARDS

PIONEERS OF *Water Soluble Cutting and Drawing Lubricants*

1730 CARLTON STREET · PHILADELPHIA 2, PA.

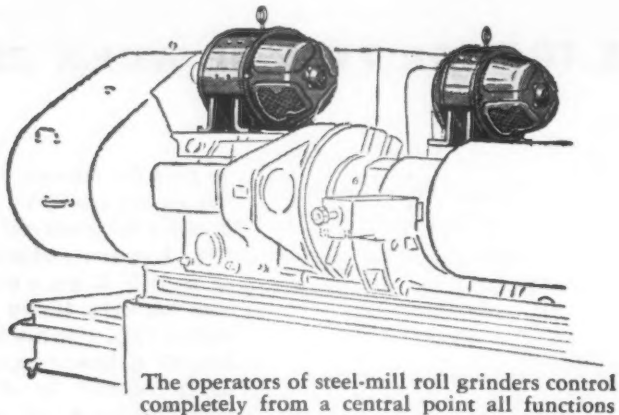


CONTROL!

Electric motor-drive, properly applied, can be used not only to supply power but to *control* a wide variety of production operations—*electrically* rather than mechanically. The results, in improved speed and quality of work, simplified design and reduced costs are frequently remarkable.

This control is accomplished through characteristics that are inherent in Reliance Electric Motor-Drive. Starting, acceleration and speed changes are simply and effectively controlled, automatic reversal can be provided at any desired point in a cycle of operations, tension can be properly and constantly maintained in the processing of such materials as metals, paper and cloth.

The "know how" which enables Reliance men to offer constructive help in working out improvements in machine design or production processes comes from applying electric motor-drive in many ways in many industries. It will pay you to take advantage of their experience.



The operators of steel-mill roll grinders control completely from a central point all functions of their huge machines, many of which are powered by as many as 9 Reliance Motors.

RELIANCE A·C D·C MOTORS

RELIANCE ELECTRIC & ENGINEERING CO.

1088 Ivanhoe Road • Cleveland, Ohio

Birmingham • Boston • Buffalo • Chicago • Cincinnati • Detroit • Greenville (S.C.) • Houston • Los Angeles • Minneapolis • New York Philadelphia • Pittsburgh • Portland (Ore.) • St. Louis • Salt Lake City • San Francisco • Syracuse • Washington, D. C. • other principal cities.

FOR VICTORY
BUY UNITED STATES WAR BONDS AND STAMPS

BONDERIZED Sheet Steel

FOR MODERN BODY UNITS

The new Bonderized-Galvanized sheets lend themselves to the fabricating and forming necessary in the modern commercial body.

For Trucks, Buses or Trailers Bonderized-Galvanized, or Bonderized Zinc-Flash sheets offer a new manufacturing material with resistance to corrosion.

To the strength and working qualities of steel, are added the rust resistance of zinc and the paint-holding efficiency of Bonderizing—delivered to you from the mill ready for fabrication.

Bonderized, zinc-coated sheets are ideal for all types of commercial vehicles that must stand continuous hard usage. They take the hard knocks and retain fine appearance. The cost of finish maintenance is reduced—"time out" for finish reconditioning is cut to a minimum.

PARKER RUST PROOF COMPANY

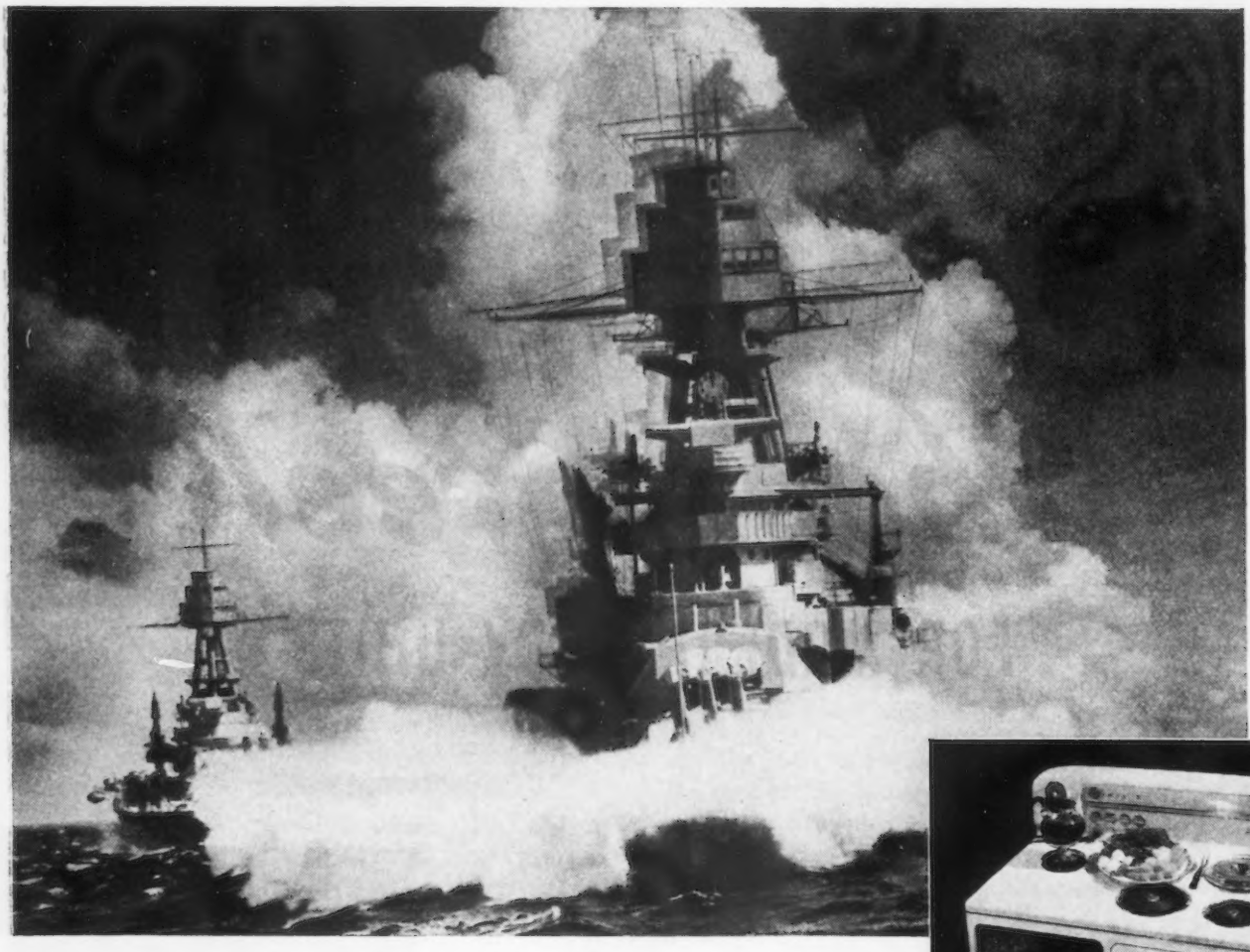
2186 E. MILWAUKEE AVE. • DETROIT 11, MICHIGAN

BONDERIZING • PARKERIZING • PARCO LUBRIZING

HOLDS PAINT TO STEEL | PREVENTS RUST | RETARDS WEAR

PARKER PRODUCTS CONQUER RUST

Making strong the things that make America strong



Holding a Ship's Shape . . .
Shaping a Stove's Course

THAT SHIP . . . defying a rough-and-tumble fighting ocean . . . needs stiff-willed stamina in the bolts and nuts that secure its ribs.

That stove . . . built on a fast-moving production schedule . . . needs bolts and nuts that are quick on the get-away and take tightening without fumbling or jamming.

For fastening strength that will resist whatever beating a ship or steam-shovel or stone-crusher can give . . . for accurate mating that hurries a product along an assembly line: fasten with RB&W bolts and nuts.

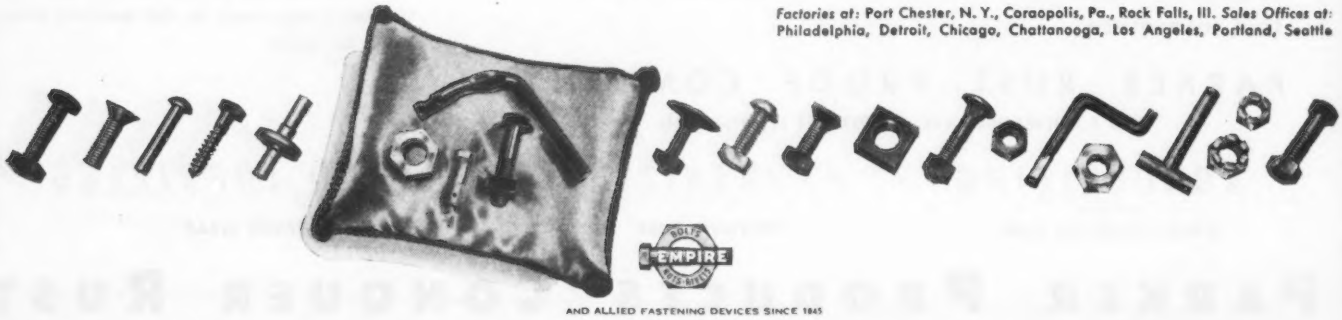
RB&W developments in cold-forming and cold-punching have set new standards in holding power, accuracy and appearance for all kinds of fastening devices.

The dependability you would expect from the accumulated experience of 99 years and the results of hundreds of thousands of dollars' worth of research work . . . is wrapped up with every shipment of RB&W products. Little wonder that so much of the best-known farm machinery, transportation equipment, electrical appliances, construction equipment and furniture is put together faster and held together better by RB&W fasteners.

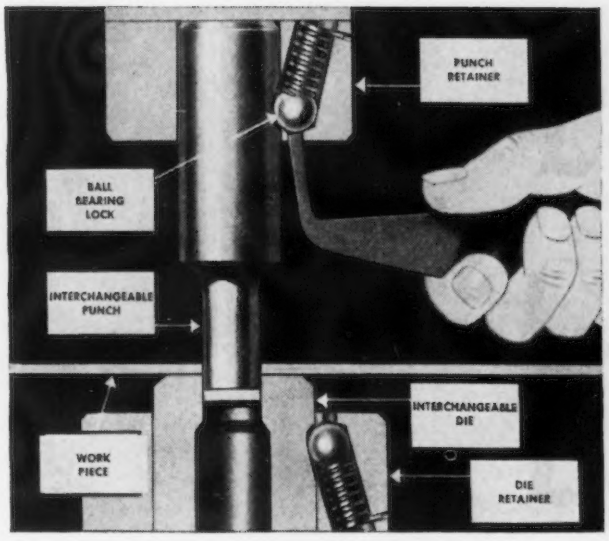
RB&W

RUSSELL, BURDSALL & WARD BOLT AND NUT COMPANY

Factories at: Port Chester, N. Y., Coraopolis, Pa., Rock Falls, Ill. *Sales Offices at:* Philadelphia, Detroit, Chicago, Chattanooga, Los Angeles, Portland, Seattle



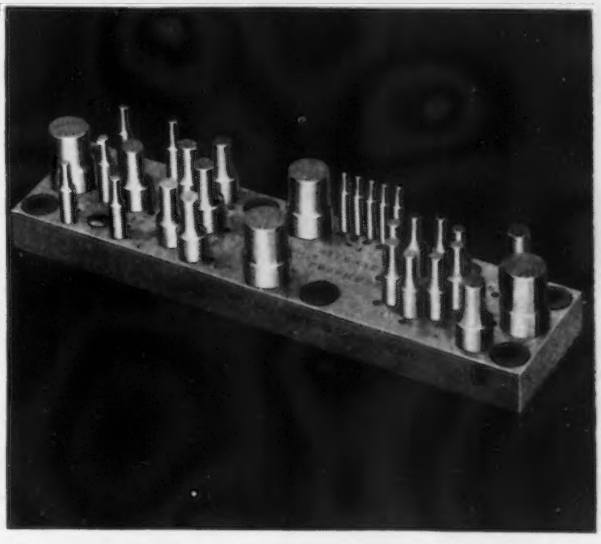
AND ALLIED FASTENING DEVICES SINCE 1845



Showing the method of releasing either the punch or die simply by depressing the ball-bearing with special hand tool provided. Unnecessary to remove die from press.

A few of the special shapes produced in R-B Interchangeable punch points. They may be made of any material and in any shape or size to fit your job.

Service with a punch!



Special punch retaining plates are made where center distances are too close to use standard retainers. Hole sizes can be changed without affecting plate pattern.

BY RICHARD BROTHERS—

SOLE PRODUCERS OF THE ORIGINAL

INTERCHANGEABLE PUNCH AND DIE

For years the patented Interchangeable Punch and Die of Richard Brothers' Division of Allied Products Corporation has been in the service of the metal working industry —delivering a knock-out blow to production delays and high labor costs. Today it has become the accepted standard of efficiency in the field of laminated plastics as well. The wide application and money-saving possibilities of this "first aid" to multiple punching operations is indicated by the illustrations on this page. For a more complete preview of "Service with a Punch" write for the R-B catalog. Better still, bring your blueprints or layout problems direct to us.

"IT'S AN ALLIED PRODUCT!"—Allied Products Corporation and its divisions, Richard Brothers and Victor-Peninsular, in Detroit and Hillsdale, Michigan, also make: Sheet metal dies, steam-heated plastic molds, jigs and fixtures, cold forged parts, production parts, aircraft engine and gun parts, and other special precision products.

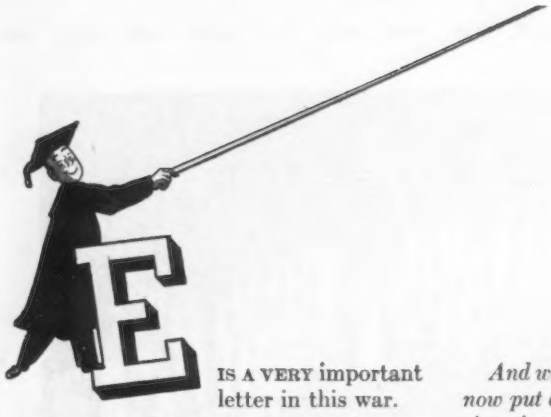
BUY WAR BONDS

ALLIED PRODUCTS CORPORATION

Executive Office: 4646 Lawton Avenue • Detroit 8, Mich.

★ ★ *All four plants have now added a star to their Army-Navy "E" Pennants* ★ ★

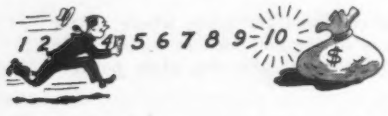
Some ABC stuff about E



IS A VERY important letter in this war.

It's the name of the War Bonds you buy—"War Savings Bond Series E."

As you know, a Series E Bond will work for you for ten full years, piling up interest all that time, till finally you'll get four dollars back for every three you put up. Pretty nice.



The first job of the money you put into "E" is, of course, to help finance the war. But it also gives you a wonderful way to save money.

And when the war is over, that money you now put away can do another job, can help America swing over from war to peace.

There'll come a day when you'll bless these Bonds—when they may help you over a tough spot.

That's why you should make up your mind to hang on to every Bond you buy. You can, of course, cash in your Bonds any time after you've held them for 60 days. You get all your money back, and, after one year, all your money plus interest.

But when you cash in a Bond, you end its life before its full job is done. You don't give it its chance to help you and

the country in the years that lie ahead. You kill off its $4-for-every-$3 earning power.

All of which it's good to remember when you might be tempted to cash in some of your War Bonds. They are yours, to do what you want with.

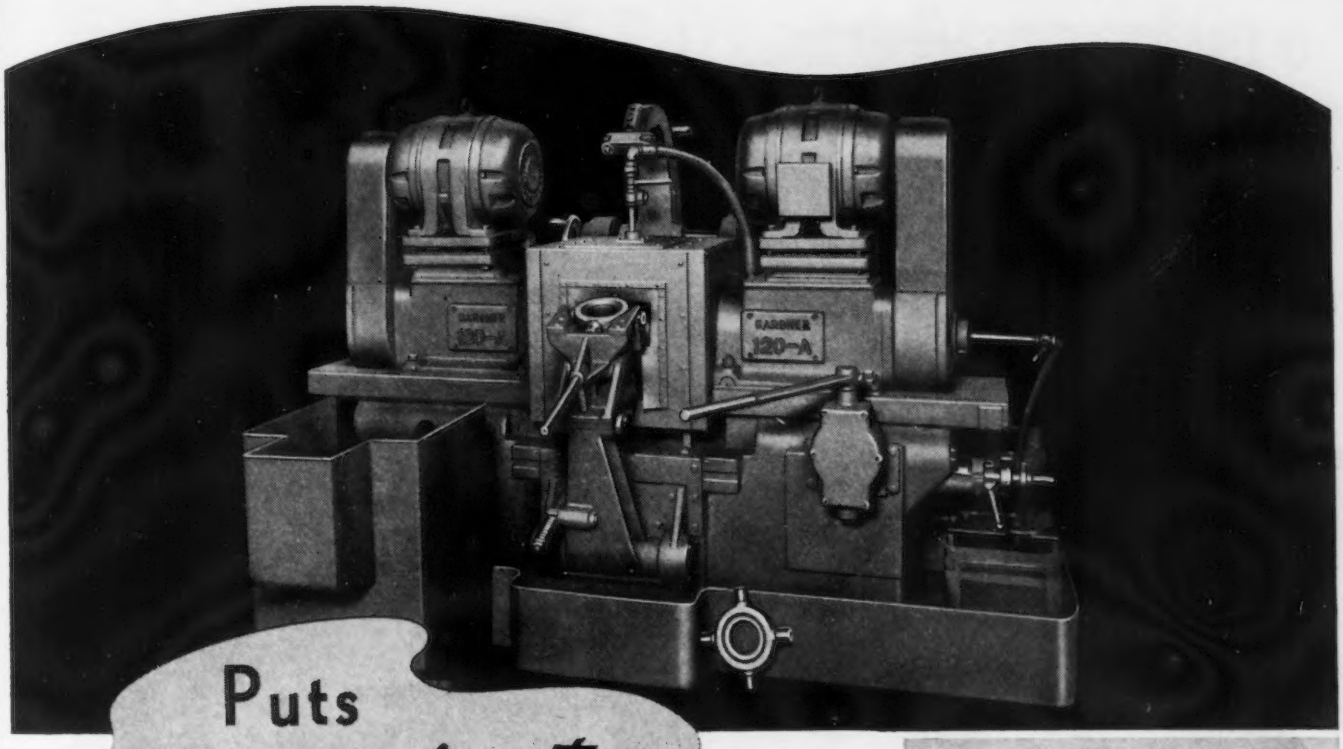
But . . . it's ABC sense that . . .

They'll do the best job for you and for America if you let them reach the full flower of maturity!

WAR BONDS to Have and to Hold

The Treasury Department acknowledges with appreciation the publication of this message by

THE IRON AGE



Puts *more minutes* into every *man-hour!*

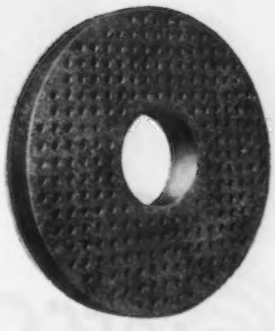
THAT'S exactly what Gardner DOUBLE-GRINDING is doing for dozens of shops—increasing production on hundreds of parallel-surface jobs.

For by this modern method, TWO surfaces are ground simultaneously, in contrast to the single-surfacing operation formerly employed in most cases.

Even on a purely hand-operated machine, like the No. 120A-20" unit shown here, excellent results are recorded. The large universal joint spiders seen, are handled in a clamping fixture carried on a Hand-operated Swinging Arm. PRODUCTION: 30 to 40 spiders per hour, complete on 4 ends, and held to .002" for squareness and uniformity.

Write for data on GARDNER-GRINDING!

GARDNER *Double-* GRINDING for *greater production* of flat surfaces

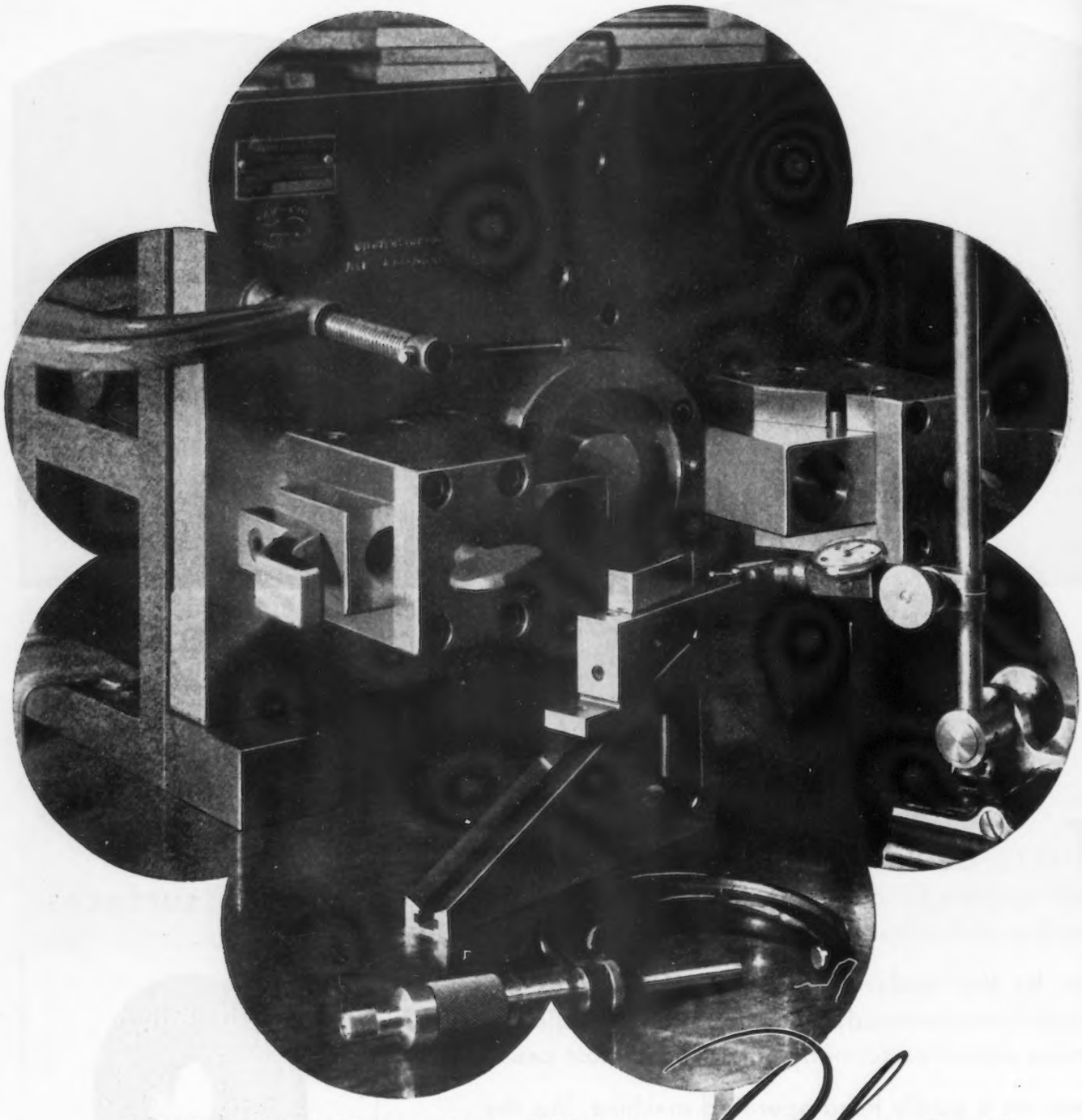


GARDNER WIRE-LOKT DISCS *mean more efficient* DISC GRINDERS

ARMY E NAVY

GARDNER MACHINE COMPANY

412 East Gardner Street , , , , Beloit, Wisconsin, U.S.A.



PRECISION IN FULL *Bloom*

OLOFSSON

Designers of Tools, Dies, Jigs and Fixtures
Designers and Builders of Special Machines

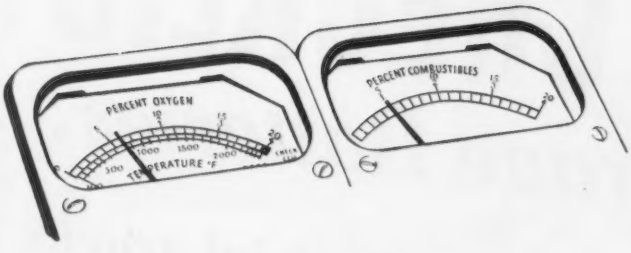
Just as a flowering plant reaches its highest development, when it bursts into bloom, this example of Olofsson's specialization embodies precision refined to its highest degree. Though it must be nameless, this fixture is destined for something big in industry. Such skill as it requires is in demand throughout the industrial world. Do any of your problems need the like of Olofsson ability?

OLOFSSON TOOL AND DIE COMPANY

LANSING, MICHIGAN

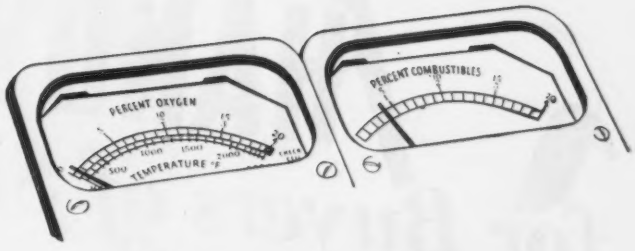
Chicago Engineering Office, 600 South Michigan Avenue

How to Control Furnace Atmosphere



Make this Test

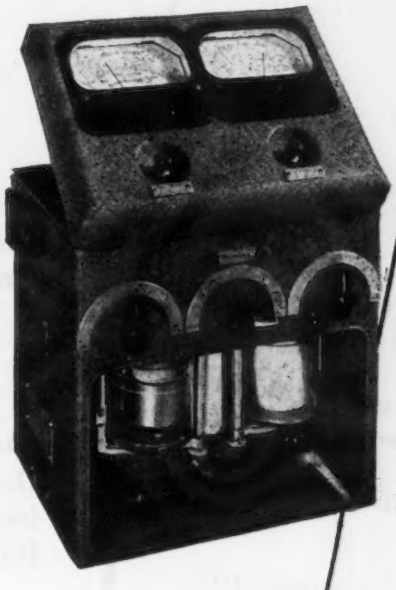
Have a Cities Service Engineer, with the aid of the Industrial Heat Prover, take a test reading* of any combustion equipment in your plant. Note percentage of needless excess oxygen in the furnace atmosphere as registered on the Heat Prover dials.

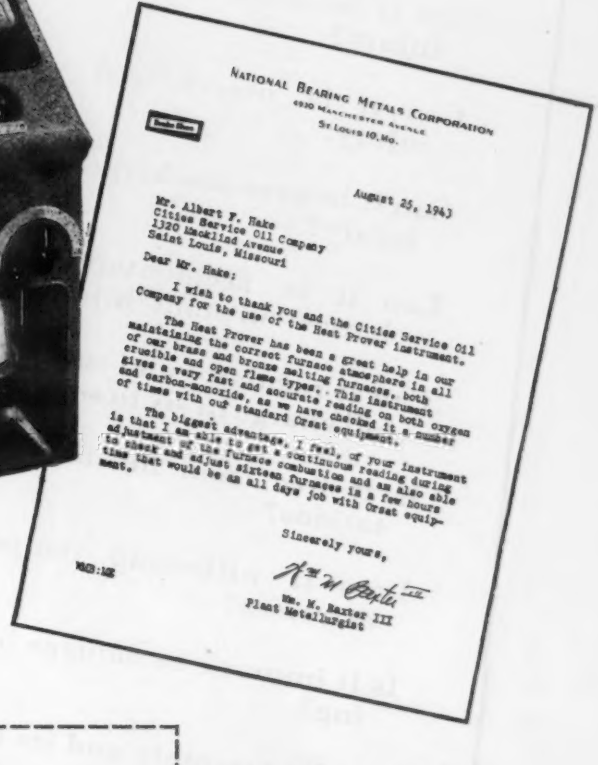


See the Results

The Cities Service Engineer may then evaluate the Heat Prover analysis against his data and curve charts which are the Standard of Efficiency for the particular equipment . . . and make recommendations for correcting the defect—which in this case would reduce excess oxygen to ½%.

THE CITIES SERVICE HEAT PROVER reveals the degree of waste caused by air deficiency (excess fuel), or the degree of waste caused by dilution (excess air). Through unique means these conditions are measured directly on the two Heat Prover dials . . . one indicates the percentage of unused combustibles, and the other the percentage of excess oxygen which may be present in the spent gases. These readings are continuous and can be made at any instant from combustion samples taken from any part of the furnace, pit or crucible atmospheres.





NATIONAL BEARING METALS CORPORATION
4910 MANCHESTER AVENUE
ST. LOUIS 10, MO.

August 25, 1943

Mr. Albert F. Hake
Cities Service Oil Company
1320 Brooklind Avenue
Saint Louis, Missouri

Dear Mr. Hake:

I wish to thank you and the Cities Service Oil Company for the use of the Heat Prover instrument.

The Heat Prover has been a great help in our maintaining the correct furnace atmosphere in all of our brass and bronze melting furnaces, both crucible and open flame types. This instrument gives a very fast and accurate reading on both oxygen and carbon-monoxide, as we have checked it a number of times with our standard Orsat equipment.

The biggest advantage, I feel, of your instrument is that I am able to get a continuous reading during adjustment of the furnace combustion and am also able to check and adjust sixteen furnaces in a few hours time that would be an all days job with Orsat equipment.

Sincerely yours,

Wm. M. Baxter III
Plant Metallurgist

WMB:MH

*Mail this Coupon

***TODAY FOR AN INDUSTRIAL HEAT PROVER TEST OF YOUR EQUIPMENT*—AT NO COST OR OBLIGATION TO YOU.**

CITIES SERVICE OIL CO.
Room 155
Sixty Wall Tower
New York 5, New York

Gentlemen: Please contact me regarding your Industrial Heat Prover Test.

Name_____

Title_____

Company_____

City_____

(Available only in Cities Service Marketing Territory East of the Rocky Mountains.)

CITIES SERVICE OILS
ONCE-ALWAYS

CITIES SERVICE OIL COMPANY
ARKANSAS FUEL OIL COMPANY

HANDY CHECKLIST

for Buyers of Storage Batteries...

for industrial trucks and tractors

Is the battery rugged enough to withstand severe physical shock and vibration?

Can it be shortcircuited without injury?

Can it be overcharged without injury?

Can it be over-discharged without injury?

Can it be accidentally reverve-charged without injury?

Can it regularly and safely take a full charge in six to seven hours?

Is it free from finish-rate limitations?

Does it withstand temperature extremes?

Is it immune to damage by freezing?

Are its assembly and its cell connections simple?

Is its life longer than any other type?

?

IF

the answer to ALL these questions is "YES," the battery is an Edison Alkaline Battery.

IF

the answer to ANY ONE of these questions is "YES," the battery is an Edison Alkaline Battery.

Edison
ALKALINE BATTERIES

EDISON STORAGE BATTERY DIVISION, THOMAS A. EDISON, INCORPORATED, WEST ORANGE, NEW JERSEY

...THESE MODERN

NIAGARA PRESSES

TURN OUT MORE PER HOUR

7 TO 190 TON CAPACITY

NIAGARA MACHINE AND TOOL WORKS, BUFFALO, N. Y.

Branches: New York Cleveland Detroit

TOUGH FASTENERS for TOUGH AMPHIBIANS

Photo Courtesy Food Machinery Corp.

CLEVELAND SAE 1035 Heat Treated Cap Screws

have fighting strength you too can rely on for your high-stress fastening jobs

Cleveland 1035s are used in the LVT Water Buffalos—amphibian tanks.

CLEVELAND FASTENERS

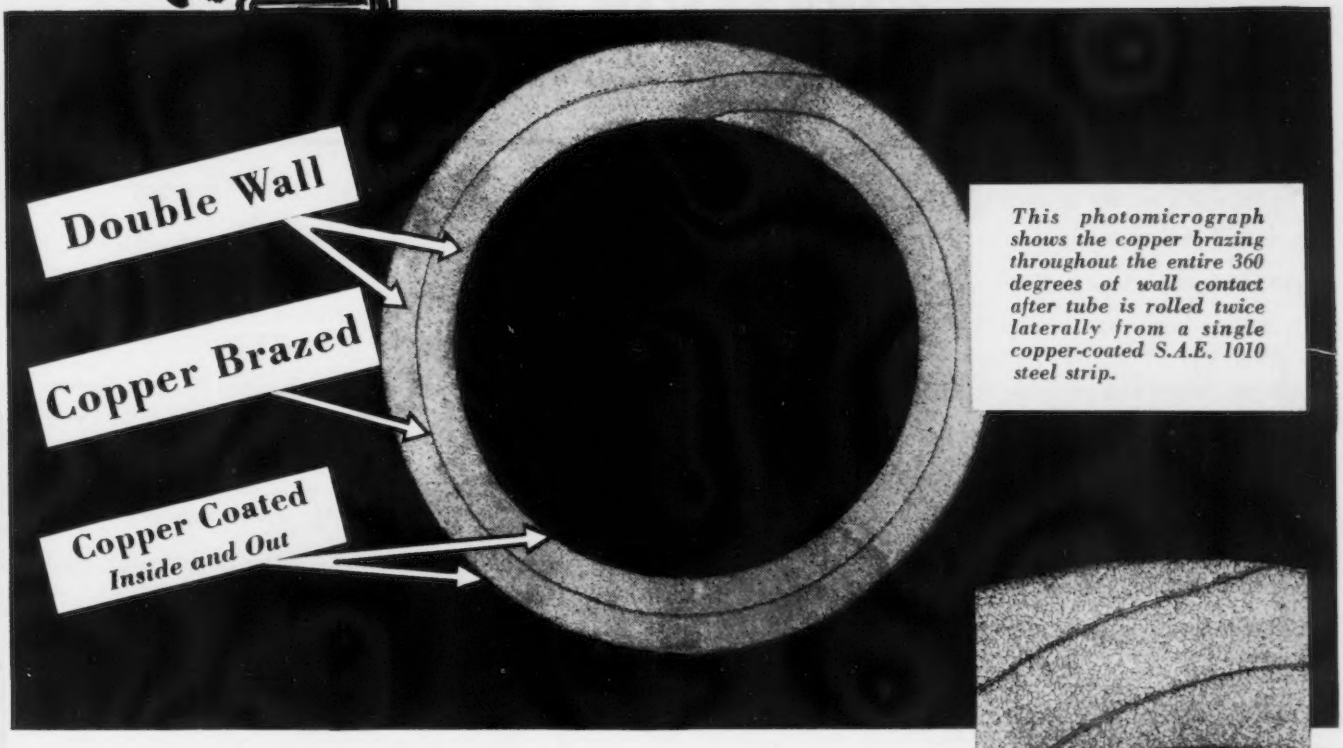
The Cleveland Cap Screw Company

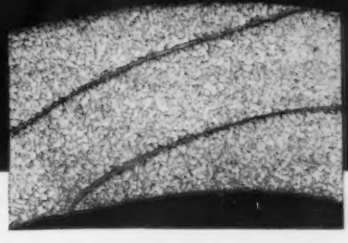
2917 EAST 79TH STREET • CLEVELAND 4, OHIO

Warehouses: Chicago, Philadelphia, New York, Los Angeles

MADE BY THE ORIGINATORS OF THE KAUFMAN PROCESS FOR GREATER STRENGTH AND ACCURACY

Take a Good Look at
BUNDYWELD
The Solid Double Wall Steel Tube


Double Wall
Copper Brazed
Copper Coated
Inside and Out
This photomicrograph shows the copper brazing throughout the entire 360 degrees of wall contact after tube is rolled twice laterally from a single copper-coated S.A.E. 1010 steel strip.

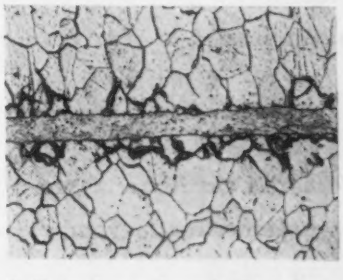


This photomicrograph of Bundyweld tubing shows a still greater enlargement of the joint. Note how the beveled steel strip makes a perfectly-shaped joint without any visible seam.

See What the Microscope Reveals

When Bundyweld tubing is under the microscope, as it is here, you can see the uniform, solidly bonded structure of this double wall steel tube . . . how the two steel walls are copper brazed throughout the entire 360 degrees of wall contact by Bundy's special brazing process.

From the brazing furnace and long cooling chamber, both with reducing atmospheres, Bundyweld emerges with a clean, mirror-like finish and high ductile properties which make this tubing easy to fabricate. It is furnished hard or annealed, in a wide range of standard diameters and gauges up to $\frac{5}{8}$" O. D. Special sizes cold drawn as desired. Also furnished in Monel. For details — write Bundy Tubing Company, Detroit 13, Michigan.



Still further enlarged, this photomicrograph of the union between the two walls shows how the copper diffuses between the steel grains to form a perfect bond of the two metals.

"FAMOUS LIFE LINES" FOR WAR AND PEACE

BUNDY TUBING

ENGINEERED TO YOUR EXPECTATIONS

Food is Vital.
Plant a Victory Garden This Year.

BUNDY TUBING DISTRIBUTORS:

Pacific Metals Company, Ltd. 3100 19th Street San Francisco, California	Standard Tube Sales Corp. 1 Admiral Avenue Maspeth, New York City, N. Y.	Lapham-Hickey Company 3333 W. 47th Place Chicago, Illinois	Rutan & Company 112 South 16th Street Philadelphia, Pennsylvania	Eagle Metals Company 3628 East Marginal Way Seattle, Washington

Brevity is the Soul of Wit—

WHEN IT COMES TO

Conserving Paper

SURE IT'S EASIER to let your dictation roll along. Sure it's easier to write long copy. Sure it's easier to do all the good, pleasant things of normal peacetime business when paper is like water, something you can pretty well use as you will.

But now, when the increasing paper needs of the armed services daily decrease the national supply of paper—when paper is a true war essential—that's a different story.

All of us in business must watch every piece of paper or paper board we use. We must judge its use in terms of absolute necessity. We must not use a single piece, a single inch, of paper which thriftier writing or printing or packaging can possibly save.

For multiplied on a national scale, that particular piece or inch of paper or paper board becomes the tonnage needed by our service forces to ship precious food and ammunition and weapons and medical supplies and blood plasma to our troops overseas.

If there's no Paper Conservation Committee in your organization or in your community, why not get one going today?

This advertisement prepared under the auspices of the War Advertising Council in co-operation with the Office of War Information and the War Production Board.

USE LESS PAPER BECAUSE

It takes 25 tons of blueprint paper to make a battleship.

700,000 different kind of items are shipped to the Army—and they're paper-wrapped or boxed.

"K" ration containers, shipped from the Eastern Seaboard alone, take 662 pounds of paper a month.

Each Signal Corps radio set takes 7 pounds of kraft paper, 3 pounds of book paper.

Each propelling charge for 155-millimeter shell takes 3/5 pound of paper.

USE LESS PAPER THESE WAYS

Review all printed forms periodically for essentiality; consolidation; elimination of waste space; standardization of sizes, weights, color, grade; elimination of color where possible.

Eliminate slack fills, thus effecting the economies of a smaller package.

Use 8½x5½-inch letterheads for short letters; inclose them in small envelopes.

Adjust the number of units per case to the maximum practical.

Use and re-use carbon paper consistently.

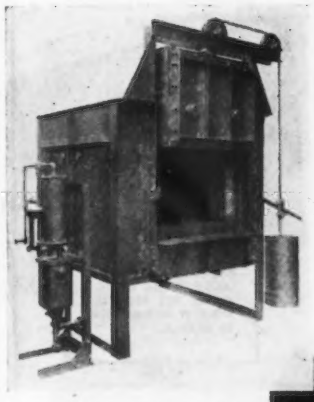
Conversely, reduce the number of units to utilize lighter carton board when such reduction will result in less tonnage over-all. Be sure that the openings are on the smallest dimension of the shipping container, so that the flaps will have the smallest area possible.

LET'S ALL USE LESS PAPER

Space for this advertisement contributed by THE IRON AGE

VULCAN FURNACES

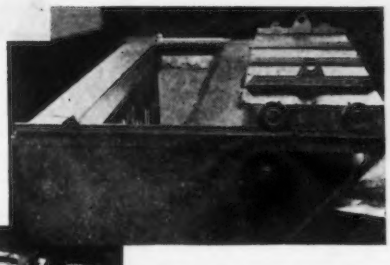
Engineered to New Standards of Efficiency, Speed and Economy!



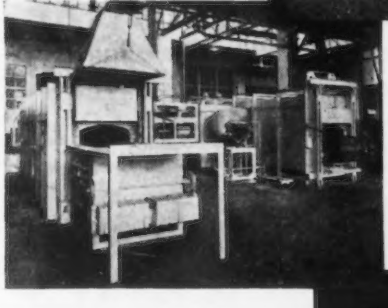
Faster treatment cycles, closer temperature uniformity, greater ease of handling even the heaviest charges, and construction that stands firm under continuous operation, are features that recommend VULCAN Furnaces for every heating and heat treating purpose.

★ ★ ★

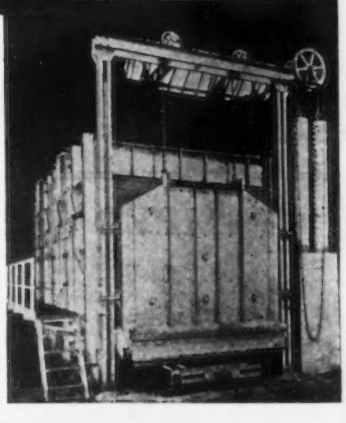
Left—VULCAN Box Type Furnace for various heating and heat treating operations at temperatures from 800° F. to 1750° F. Controlled atmosphere. Oil, gas or electric. Can be arranged for semi-continuous operation.



Right—VULCAN Salt Bath Furnace for quantity production of alloy steel parts and tools. Electrically heated by internal immersion heaters (illustrated), external radiant heaters or immersed electrodes. May also be oil or gas fired.



Left — VULCAN Automatic Hardening, Quenching and Drawing Unit for treating miscellaneous steel castings and forgings. One-man operation. Oil or gas fired, or equipped with radiant tubes or electric heaters for clean hardening. Capacity: one ton per hour.



Right—VULCAN Car Hearth Furnace for heat treating by quenching in air, oil or water from car at temperatures up to 2000° F., drawing at temperatures down to 600° F., and annealing and normalizing at 1750° F. Complete control. Oil or gas fired.

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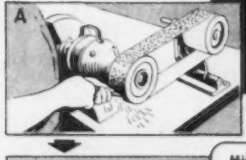

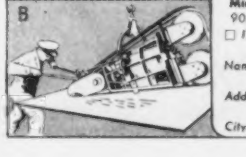

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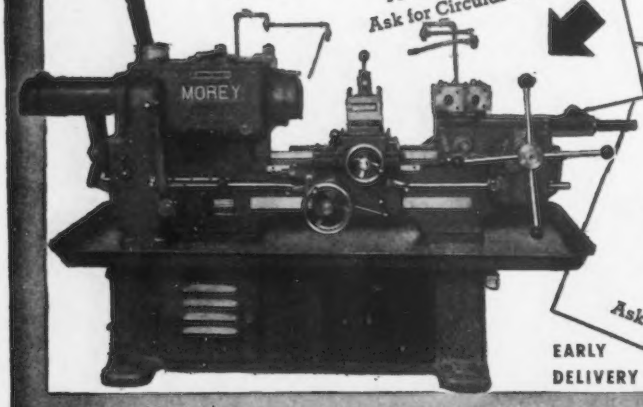

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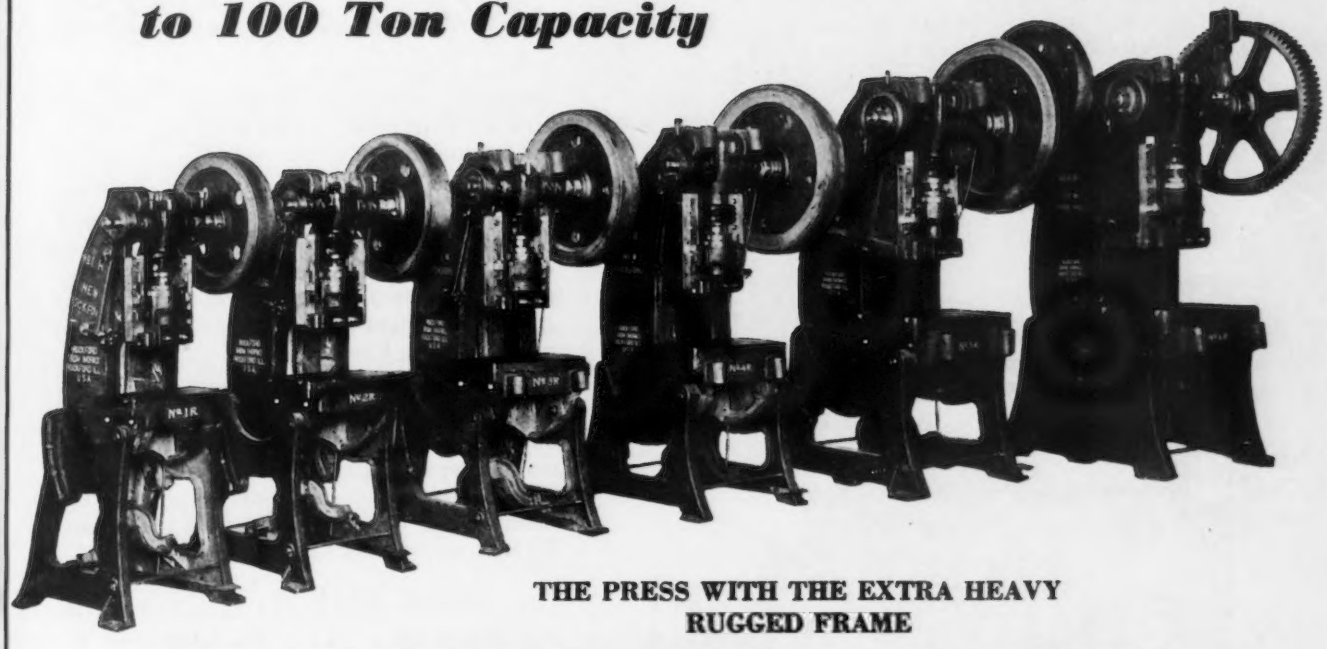

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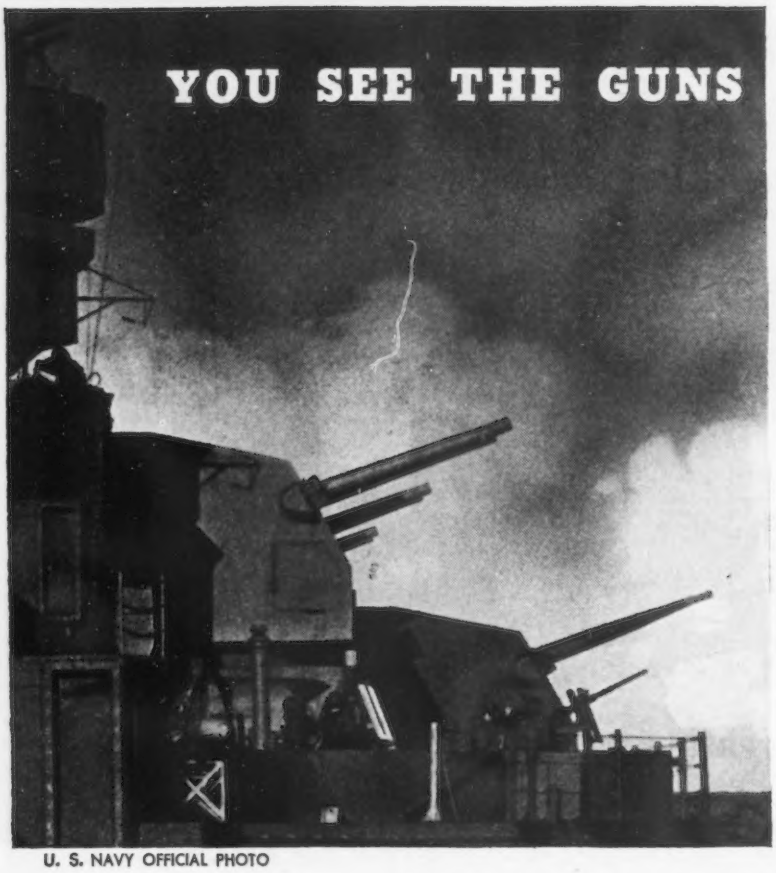

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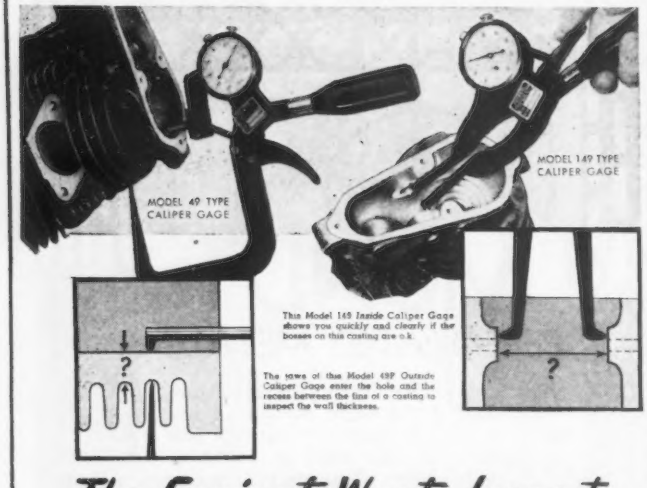
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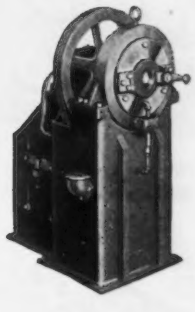

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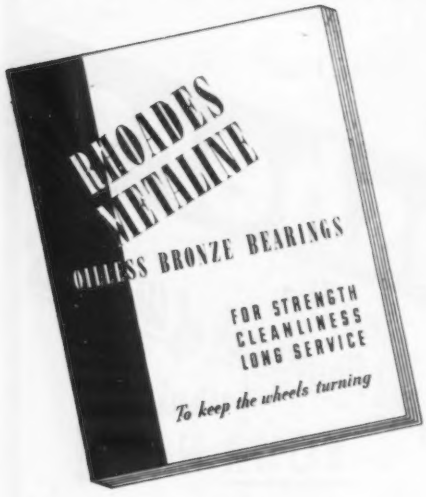

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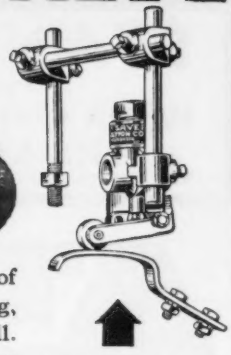

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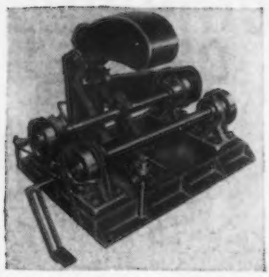

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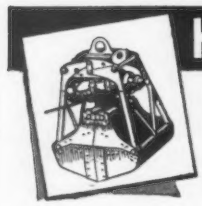

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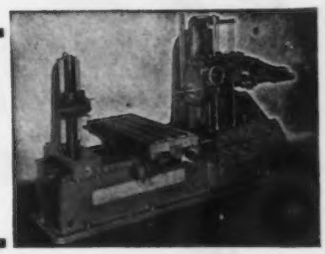

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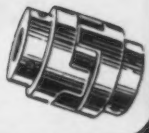

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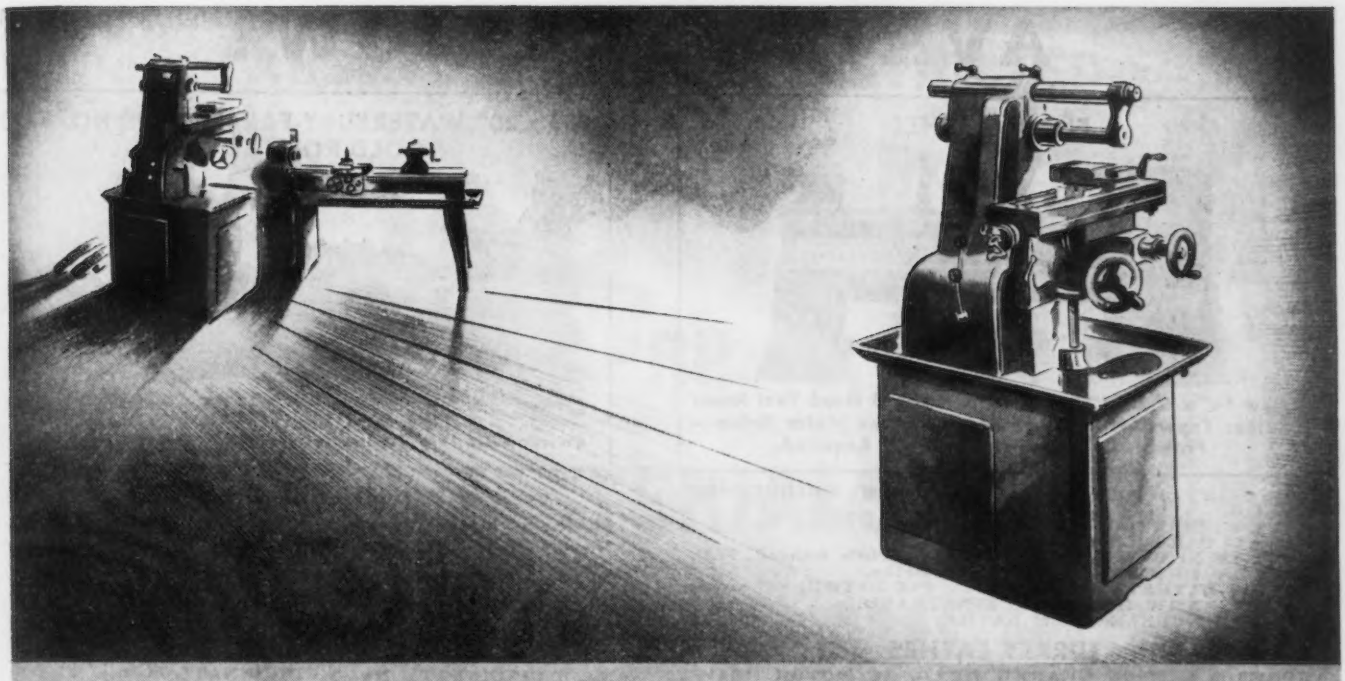

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RADIAL DRILLS—7' DRESES, 17" round column, M.D.
5½' NILES, 13" dia. column, motor drive.
4' BICKFORD, universal, 11" dia. col., motor drive.

BORING MILLS—42" PUTNAM vertical, q.c. feeds, 2 heads, M.D. rapid traverse.

LATHES—36"x12' DRAPER, chuck, cam. attach.
32"x12' PITTSBURG, q.c., heavy duty, M.D.
20"x10' LODGE & SHIPLEY, 12 speed geared head, M.D.
16"x8' LeBLOND, Q.C. drop lever feeds, motorized.

MILLERS—#2 ROCKFORD, heavy, plain, all power feeds, motor drive.
#1½ BROWN & SHARP, universal, q.c. feeds, M.D.
2—FOX, plain, table 27"x6¾", power feed, M.D.

GRINDERS—#2 BROWN & SHARP, universal, 12"x30".
#1 WILMARTH & MORMAN, surface, cap. 6"x14", mag. chuck.

PLANERS—36"x36"x10' GRAY, "Extra Heavy,"3 heads.
30"x30"x8' GRAY, spiral drive, 2 heads, M.D.

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2486	Ingersoll-Rand	20 & 20 x 16	35#	Belted
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1302	Ingersoll-Rand	20 & 12½ x 16	100#	Belted
888	Ingersoll-Rand	19 & 12 x 16	100#	Belted
599	Ingersoll-Rand	16 & 10 x 14	100#	Belted
368	Chicago Pneumatic	12 x 10	100#	Belted
254	Bury	10 x 10	125#	Belted
215	Ingersoll-Rand	9 x 10 x 8	75#	Steam
160	Ingersoll-Rand	7 x 6	100#	Gasoline
122	Sullivan	8 x 6	50#	Belted
92	Penna.	7 x 6	100#	Belted
92	Ingersoll-Rand	5 x 5	100#	Gasoline

MOTOR GENERATOR SETS

250 KW Gen. Elec. MPC 250 V. 3/60/2300/1200 RPM Syn.
200 KW Crocker-Wheeler 250 V. 2 or 3/60/2300/900 RPM Synchronous.
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50 KW Gen. Elec. 125 V. 3/60/2200/720 RPM.
40 KW Westinghouse SK 150 V. 3/60/220/440/1200 RPM Synchronous.

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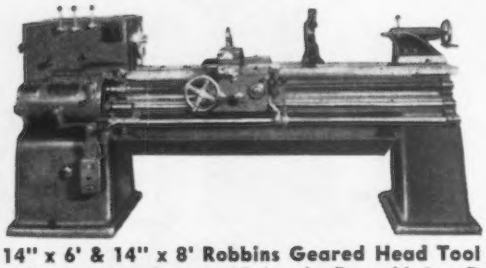

New 14" x 6' & 14" x 8' Robbins Geared Head Tool Room Lathe; Taper Attachment, Motor in Base Motor Drive—Prompt Delivery—No Priority Required.

30" x 12' LEBLOND, Q.C.G.; 26" x 8' BRIDGEFORD, Q.C.G.
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14" x 6' CARROLL JAMIESON.
42" x 18' NEW HAVEN, 10' centers, Triple Geared, M.D.
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30' PIT LATHE, Face plate 156"; PIT LATHE, 86" swing.
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2¼" x 24", Bar Feed (4).
2¼" x 24", CHUCKERS (2).
3" x 36", Bar Feed (1).
3" x 36", Chucker (1).
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4—No. 6-A POTTER & JOHNSTONS.
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28" NILES BEMENT POND, Gd. Hd., 4½" hole.
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2⅛" GRIDLEYS—1 spindle (2).
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No. 52 GREENFIELD HYDROILS, Hydraulic Feed, B.B.
Nos. 70 & 60 HEALD.

SURFACE:

No. 16A BLANCHARD 30" Mag. chuck, 18" wheel. No. 16 BLANCHARD, 26" mag. chuck, M.D.
15" x 15" x 96" NORTON, 2 mag. chucks. No. 2 W&M.

CYLINDRICAL:

14" x 72" NORTON, 2" x 16" wheel.
No. 22 LANDIS, 12" x 34", Power Feed, Pump & Pan.

UNIVERSAL:

No. 13 BROWN SHARPE, No. 2 CINCINNATI.
No. 1 LANDIS; BATH UNIVERSAL.

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No. 263 & No. 242 BARNES, 25" & 26", 34" BARNES.
36" PRENTICE; 2 SPINDLE FOOTE BURT, Heavy Duty.

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5' & 4' REED PRENTICE, Motor Drive.
4' AMERICAN, No. 5 M.T., 11" column.
4 Ft. FOSDICK, S.P.D.
3' FOSDICK, No. 4 M.T., 10" col.

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36" SELLERS PLATE PLANER, Pneu. holddowns; M.D.
60" x 60" x 18' WOODWARD POWELL, 4 heads.
60" x 60" x 18' NILES, 2 heads on rail, M.D.
44" x 36" x 12' GRAY, 2 heads on rail.
30" x 8' WHITCOMB. 27" x 5' NEW HAVEN.

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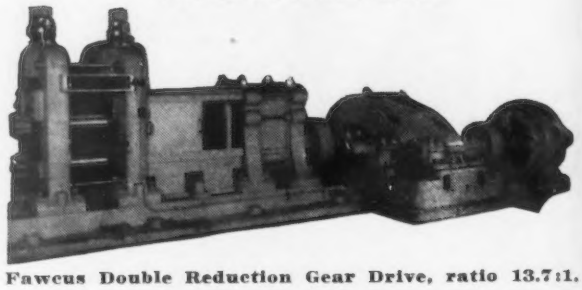
Newton Keway Miller. 20' Draw Bench.
100,000 LB. OLSEN TESTING MACHINE.

16" x 20" WATERBURY-FARREL TYPE NO. 4350 COLD ROLLING MILL



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No. 1 KEMPSMITH. No. 1½ HENDEY NORTON.

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No. 2½B KEARNEY-TRECKER.

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6" x 48" PRATT & WHITNEY, No. 3 LEES-BRADNER.
6" x 72" PRATT & WHITNEY, M.D.

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OHIO TYPE P, M.D., TABLE 16" x 72", TIMKEN BEARING SPINDLE, NEW 1941.
24" and 18" CINCINNATI Automatics, M.D.
10" PRATT & WHITNEY Semi-Automatic.
No. 45 PRODUCTOMATIC, BILTON CAM MILL.
2" PRATT & WHITNEY Duplex Spline Mill.

MILLS—PLANER TYPE & SLAB

44" x 40" x 10' INGERSOLL PLANER TYPE; Adjustable rail; 4 heads.
42" x 12' INGERSOLL PLANER TYPE; 2 side heads, 1 vertical head.
42" x 42" x 13' INGERSOLL SLAB; 1 vert. hd., M.D.
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8" NILES-BEMENT-POND, Floor type. Extra high column, All geared feeds, M.D. with motor.
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5" DETRICK HARVEY, Floor type, M.D., No. 6 M.T.
3½ No. 32 GIDDINGS LEWIS, M.D.; 36" x 54" table.
3⅛" No. 0 GIDDINGS LEWIS, Table type, M.D.; No. 5 Mil
3" LUCAS, Table type, M.D., 3" PUTNAM.
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4" KEMPSMITH; 3" MORRIS.
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72" & 60" COLBURNS, Gd. feeds, Rapid traverse.
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28" ROCKFORD, Gear box, M.D.
28" OHIO, Heavy Duty (2).
7" PORTER CABLE, 13" POTTER & JOHNSTON.

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No. 6 FELLOWS GEAR SHAPER, 36" Capacity.
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No. 36BT GOULD & EBERHARDT TURRET TYPE BEVEL ROUGHER.

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Niagara No. 672- 72" Shear,
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Taylor Winfield 27 K.V.A. Spot Welder,
3 Gibbs 12 K.V.A. Spot Welders

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Toledo No. 57, 175 Ton,
Bliss No. 77, 175 Ton,
Bliss No. 66, 125 Ton,
Toledo No. 56, 100 Ton,
2 Ferracute S.R.C. 102, 100 Ton,
2 Cleveland No. 54, 120 Ton,
Cleveland No. 57, 125 Ton,
Ferracute D.G. 5, O.B.I., 75 Ton,
2 London Toggle Presses, 100 Ton,
R.K. American Can No. 65, 80 Ton,
Stoll No. 67, 70 Ton,
Toledo No. 93C, 80 Ton,
Lashbough-Jordan No. 3, O.B.I., 45 Ton,
Lashbough-Jordan No. 4, O.B.I., 30 Ton,
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2 Toledo No. 2, O.B.I., 30 Ton,
2 Lashbough-Jordan No. 5, O.B.I., 45 Ton,
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3 Consolidated No. 6, O.B.I., 60 Ton,
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Toledo No. 162 Toggle Press,
6 Toledo No. 5A, O.B.I., 45 Ton,
Consolidated No. 22 Horn Press, 15 Ton,
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3 Toledo No. 6, O.B.I., 60 Ton,
Toledo No. 92B, 50 Ton,
Consolidated 3C, O.B.I., 30 Ton,
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Niagara No. 5, O.B.I., 30 Ton,
Stoll No. 16, 45 Ton,
Walsh No. 4, O.B.I., 30 Ton,
Toledo No. 6A, O.B.I., 60 Ton

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No. 1-14 Kent Owens Horizontal Hydraulic,
No. 0½ Cincinnati Horizontal, M.D.,
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6 Buffalo Single Spindle 4", M.D.
Barnes, S.S. 8", M.D.,
Excelsior S.S. 6", M.D.,
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Henry & Wright S.S. 6", M.D.

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Haskins Tapper,
Renccel 8x12x30 Furnace with Pyrometer Control,
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No. 3½ Greenard Arbor Press,
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8 Rectoplaters Udylite Mallory Standard Type,
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22 Steel Plating Tanks,
Anodes

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Elwell Parker Electric Truck, High Lift, Style C-36,
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EQUIPMENT A.C. Electric Motors; Two Dodge 1½ Ton Dual Type Automobile Trucks; Chevrolet ¾ Ton Pickup Truck; Heat Treating Equipment; Metal Shelving; Metal Racks; Metal Tables; Factory Trucks; Metal Factory Boxes; Iron Racks; Die and Tool Bin Racks; Franklin Portable Cranes; Fairbanks Floor Scales; Counter Scales; Exhaust Fans; Blowers; Fire Extinguishers; Bench Vises; Metal Bench Tables; Neon Factory Lights; Shop Stools; Stencil Machines; Time Recorders; 100 Tons of Dies; Oven Conveyor Drive; Steel Lockers; First Aid Room Equipment; Glue Tape Machines; Belting, Line Shafting, etc.

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#1 Rockford, Vert. Attch., M.D.
#2 Cincinnati, Universal, M.D.
#5 Brown & Sharpe, Lima Drive, M.D.
#3 Becker, vertical, motorized

TURRET LATHES

⅝" Pratt & Whitney, motor
1⅛" Garvin, bar feed
1⅞" Smurr & Kamen, power and bar feeds

LATHES

14" x6' Hendey, M.D.
16" x 8' Prentice, q.c.g.b., M.D.
16/32" x 6' Pratt & Whitney gap lathe, M.D.
18" x 8' LeBlond, grd. hd., M.D.
20" x 10' Hendey, M.D.
20" x 12' LeBlond, q.c.g.b.
26" x 10' Bridgeford, q.c.g., taper attach., M.D.
27" x 14' American Tool, gear. h., tap. att., M.D.

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Tel.: WORTH 4-8125-6

AUTOMATICS

#654 New Britain; Timken bearings; M.D.

BORING MILLS

54" King Vertical; Power Rapid Traverse; Motor Drive.
62" Niles-Bement-Pond Vertical; Power Rapid Traverse; Motor Drive.
100" Niles-Bement-Pond Vertical.
4" bar Betts Horizontal.

PLANER

48" x 48" x 14' Betts; 3 heads; Box Table; Motor Drive.

SUN MACHINERY COMPANY
36 Van Vechten St. Newark 5, N. J.

PLANERS

Cincinnati 30x30x14' motor drive—2 heads
Cleveland 36x36x8' — open side—2 heads on rail, one side head
Pond 60x60x12'—2 heads
Putnam 24x24x6'

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New Turret Lathe Tooling
STOCK DELIVERY
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Collets—Collet Pads
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TURRET LATHES

#2 Acme Turret Lathe, Serial #5444 Capacity 18" x 30" Universal with 5 H.P. Motor, 550 volt and extra equipment.

GEAR HOBBING MACHINES

Schuchardt & Schutte, 24" diameter table with 3 H.P. Motor, 550 volt and extra equipment.

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#2—Brown & Sharpe, STANDARD. Motor driven, All Power Feeds, Rapid Traverse, Table 45" x 14½" Feeds, 28" x 14" x 14", 6" head travel.

MONARCH MACHINERY CO.
327 N. 3rd St. Phila. 6, Pa.

Automatic Screw Machines

BROWN & SHARPE No. 0, 2 auto. screw machines, M.D.
NEW BRITAIN ⅝", 1", 1⅝" six spindle auto. M.D.
NATIONAL ACME No. 52 four spindle M.D. (4)
CLEVELAND ¾ Model A single spindle

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1500 cu. ft. 22" and 12"x14" Sullivan. Class WN-31. M.D. 150# Pressure

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4x4x½" Buffalo Angle Bending Roll, M.D.

BENDER & STRAIGHTENER
#4 Hilles & Jones Horizontal Bending & Straightening Machine with reversible jaw. Capacity 15" I-Beams and 100# Tee or Girder Rolls

BORING MILL—VERTICAL
60" Bullard Vertical Boring Mill, B.M.D. Two Heads. Travel of Rail 36"

BRAKE—LEAF TYPE
16' Dreis & Krump #269, Motor Driven. ¾' Cap.

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45'x180' Steel Building. Including 10 ton Whiting OET Crane, 45' Span, three 220 volt D.C. Motors

CRANES—OVERHEAD ELECTRIC TRAVELING

2 ton Calumet	38'6" Span.	230 Volt D.C.
5 ton Shaw	9'6" Span.	220/3/60 A.C.
3 ton Shepard	35'4" Span.	110 Volt D.C.
5 ton Northern	40' Span.	500 Volt D.C.
7½ ton Shepard	36' Span.	220 Volt D.C.
10 ton Box	27'4" Span.	220 Volt D.C.
10 ton P & H	57' Span.	220 Volt D.C.
20 ton Niles	33' Span.	220 Volt D.C.
20 ton Morgan	60' Span.	220 Volt D.C.
3 ton Auxiliary		
25 ton Alliance	38'2" Span.	D.C.
30 ton P & H	57'6" Span.	230 Volt D.C.
75 ton Morgan	60' Span.	220 Volt D.C.
With 15 ton Auxiliary Hoist		

CRANE—GANTRY
5 ton Cleveland 40' Span Bucket Handling Crane. 44' Bridge Extension which raises and lowers. Complete with five 220 V DC Motors

CRANE—RUNWAY
780 Ft. Steel Runway—"A" Frame Construction
175 Ft. Steel Runway—"A" Frame Construction

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60 ton Henry & Wright Dieing Machine, 5" Stroke. Automatic Double Roll Feed

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Ajax, National, Acme—Various Sizes

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¾" McCabe Flanging Machine. Pneumatic Hold-down

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500 H.P. Mesta and Falk Single and Double Gear Reducers
1000 H.P. Falk Double Reduction Ratio 29.0 to 1
1200 H.P. Falk Double Reduction (2) Ratios 14.530 to 1 and 29.0 to 1

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200 lb. Bradley Cushioned Helve Hammer

HAMMERS—BOARD DROP
1500 lb. Chambersburg
1600 lb. Chambersburg
1600 lb. B&S Model "C"

HAMMERS—STEAM DROP
600 lb. Sellers
800 lb. Chambersburg, Double Frame
800 lb. Erie
1500 lb. Massillon

HAMMERS—STEAM FORGING
600 lb. Morgan
600 lb. Chambersburg, Single Frame
750 lb. Chambersburg, Double Frame
800 lb. N-B-P, Single Frame
1000 lb. Chambersburg, Double Frame
1100 lb. Chambersburg, Single Frame
1100 lb. Bement-Miles, Single Frame
1100 lb. Erie, Single Frame
1500 lb. Erie, Single Frame
8000 lb. Morgan, Double Frame

HOIST
7½ ton Shepard Niles Monorail Hoist. Cage Controlled. Equipped with hoist and trolley motors for D. C. current

LOCOMOTIVE
16 ton Vulcan Locomotive Gasoline Engine Driven. Six Cylinders, 5½" Bore, 7" Stroke, Track Gauge 4'8½"

LATHE—ROLL
42"x21' United Heavy Duty Roll Turning Lathe, Spur Gear Drive

PIERCING MILL
#3 Aetna-Standard Mannesman Roll Piercing Mill. Capacity 6" Tubing. Will handle billets 4" to 8" dia. copper, 4" to 6" brass. M.D.

PRESSES—HYDRAULIC WHEEL
300 ton Caldwell, 38" between bars
600 ton Chambersburg Hydraulic Duplex Car Wheel Press, 48" between bars

PRESS—STRAIGHT SIDE SINGLE ACTING
#158B Cleveland, Arr. M.D. 16" Stroke. Bed Area 48"x72". Tie Rod Construction

PRESS—TRIMMING
#55½ Toledo, Belted M.D., 3½" stroke, 20" between uprights

PUNCH—MULTIPLE
#2 Cleveland Multiple Punch, B.D. 6'2" Between Housings. 125 tons Pressure

PUNCH & SHEAR COMBINATIONS
#206 Morgan 14½ Throat. Single End. Arr. M.D. Capacity 2¼" thru 1½"
#2 Hilles & Jones Double End, Motor Driven. 22" Throat. Capacity Punch 1" thru 1"
#6 Beatty Single End. Motor Driven. 48" Throat. Capacity Punch 1" thru 1"
#2 Hilles & Jones Single End, Motor Driven. 20" Throat. Capacity Punch 1" thru 1"
#5 Long & Alstatter Single End, Belt Driven. 6" Throat. Capacity. Punch ⅝" thru ⅝"

ROLLING MILLS
7"x5½" Blake & Johnson Breakdown Mill
8"x5" Broden Single Stand Two High
9"x20" Single Stand Two High
14"x19" Waterbury-Farrel Two High Mill
20"x30" Single Stand Two High Mill
12" Merchant Bar Mill—Three High
18" United Hot Mill, 2 Three High Stands
30" Morgan Three High Billet Mill
30" United Three High Sheet Bar Mill

ROLLS—PLATE STRAIGHTENING
6' Hilles & Jones #2 Plate Straightening Roll. Six 10" Dia. Rolls ½" Cap.
24" Hilles & Jones #2 Plate Straightening Roll. Six 10" Dia. Rolls. Arr. M.D., Cap. 1"

SAW
#0 Ryerson Kling High Speed Friction Saw, M.D., equipped with self-contained hydraulic feed system

SHEARS—ALLIGATOR
No. 7 United Engr. & Fdry. Co. Alligator Shear. Arr. M.D. Capacity 6" Square
No. 6R United Engr. & Fdry. Co. Alligator Shear, B.D. Approx. Capacity 6"

SHEAR—BAR
74" United Engr. & Fdry. Co. Bar Shear. Capacity 1¼" Plate

SHEAR—SQUARING
13' Lewis or 14' United Squaring Shears. Arranged for motor drive, capacity ¼" plate

SLITTER
13" Waterbury Farrel. Arr. M.D. Complete with Scrap Cutter and Coiler. Arr. M.D.

STRAIGHTENERS
No. 1 Sutton Round Straightening Machine. Arr. M.D. Capacity 1½" Dia. Bars, 2" O.D. Tubes
⅜" Shuster Straightening and Cut-off Machine. 12' Cut-off

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50,000 lb. Olsen, 4 screw type Universal motor driven. Equipped with automatic weighing device

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500 amp. Lincoln Type SAC Elec. Welder, rating 40 volts NEMA, motor 220 volt, 3 phase, 60 cycle

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4⅝" Bar, N.B.P. Horizontal Boring Mill, Knee Type, 30"x90" table, M.D.
#0 FOSDICK Horizontal Boring, Drilling & Milling Machine, M.D.
ROCKFORD Horizontal Drilling & Boring Machine 3⅜" spindle
4' HAMMOND Hi-Speed Sensitive Radial Drill, M.D.
33"x9" GOULD & EBERHARDT Spur Gear Cutter
3' WESTERN Plain Radial Drill
7' AMERICAN Universal Radial Drill
15" GLEASON Bevel Gear Generator
14"x5' PRENTICE G.H. Lathe
42" PUTNAM Double End Car Wheel Lathe, M.D.
#3-B MILWAUKEE Plain Miller
#2 CLEVELAND Plain Miller
#10 NILES Vertical Milling Machines
#6 BECKER Vertical Milling Machine
30"x30"x10' NEWTON Slab Miller
12" Wm. SELLERS Crank Slotters
20" SELLERS Crank Slotter, M.D.
12"x12" ACME Power Hack Saw, M.D.
100"x36"x42' SOUTHWARK Heavy Planer, Four Heads, 230 Volt, D.C.
48"x48"x24' N.B.P. Heavy Planer, Two Rail, One Side Head, M.D.
48"x48"x20' PATCH Planer, 4 heads, 230 volt D.C. Rev. M.D.
24"x24"x6' WHITCOMB Planer, 230 volt D.C. Reversing M.D.
42"x48"x12' SIMMONS Openside Planer, 230 volt D.C.
#3 WARNER-SWASEY Turret Lathes, 3⅛" bar capacity
#1 L&A Multiple Punch, 100 Tons, 72" between housings
6"x6"x⅝" SOUTHWARK Double Angle Shear
SCHULTZ-NAUMANN Beam Shear, 20", 60 lb. and smaller
60" Throat, 8"x1 1/16" LONG & ALSTATTER Shear
54" Throat 1¾"x1⅛" HILLES & JONES Punch
42" Throat, 1¾"x1" HILLES & JONES Punch, M.D.
4" LANDIS Pipe Threading Machine
6" BIGNALL - KEELER Duplex Pipe Machine
10" STANDARD Pipe Threading Machine
4" BAKER Heavy Duty Automatic Tapping Machine
#0 BAKER Keyseater, M.D.

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1721 North Broadway, Albany 1, N. Y.
N. Y. Office: 149 Broadway

OTT MACHINERY SPECIALS

AUTOMATICS

Acme, Model C, 9/16", M.D., 5 spindle
Cleveland, Model A, ⅞, 1¼, 1½, 2½, 2¾, 3¾", M.D.
Cleveland Model B, ⅞, 1¼, 2 & 2½"
Cleveland, Model M ⅞" M.D.
Cleveland Model M, 1¼ & 1½", M.D.
Cleveland Model K4, 3½", M.D.
Cone, 1¼ & 1½", 4 spdle., M.D.
Gridley, 2¼, 3¼ & 4¼" single spindle
Gridley, Model F, ¾ & 1¼", M.D.
Gridley, Model G 9/16 & ⅞", M.D.
New Britain No. 22, M.D.
Potter & Johnston No. 5-A & 6-A, M.D.

BALANCING MACHINES

Norton 60" Running Balance Indicating
T. Olson, Cam & Crankshaft

DRILLS

High Speed Ball Bearing, 1 & 2 spdle.
Heavy Duty, Baker No. 4 & 5, M.T.
Heavy Duty Foote-Burt No. 5, M.T.
Radial, 3' Western, M.D.

GEAR MACHINERY

Barber-Colman No. 3 & 12
Fellows No. 6' Gear Shapers & No. 7 H.S., M.D.
Lees-Bradner No. 5A Generator, M.D.
Lees-Bradner No. 10B Gear Grinder

GRINDERS

Brown & Sharpe No. 10 & 12 Plain, M.D.
Cincinnati 12x36" Plain, M.D.
Landis 6x18" Plain, Self-Cont., M.D.
Norton 14x36 Plain, No. B81, M.D.
Blanchard R.S. No. 16A, 30"x18", Mag. Chuck
Milwaukee Face Mill, M.D.
Union T.D. Cutter, M.D.

LATHES

Lodge & Shipley, 18"x8' Q.C.T.A., M.D.
Schumacher & Boye, 18"x8' Q.C., M.D.
Barnes, 18"x10' Semi-Q.C., M.D.

MILLING MACHINES

Cincinnati No. 4 Plain, M.D.
Becker Model C & No. 5 Vertical, M.D.
Becker Model S.D. with 40" Rotary Table, M.D.
Smalley General Internal Thread

PLANERS & SHAPERS

Hamilton, 36"x36"x10', 2 heads, M.D.
Ohio, 42"x42"x10', 1 Head, M.D.
Bedford Stone, 39"x13' Open Side, M.D.
Patch Stone, 36"x13' Open Side, M.D.
Milwaukee, 16" B.G. M.D.

PRESSES

Horning, No. 39 Bliss & No. 25 Cleveland
Open Back No. 62 Bliss, 7" stroke
Solid Back, P2 Ferracute
Solid Back, No. 34 Toledo, Back Geared

RIVETERS

High Speed Hammer, No. 5½B, M.D.
Kling 60" & Whiting 30" Stake

SAWS & SHEARS

Peerless & Toledo 6"x6", M.D.
Klemm No. 2 Band, M.D.

OTT MACHINERY SALES, INC.
540 Second Ave. Detroit 26, Mich.

CYLINDRICAL GRINDER

12"x72" Cincinnati Plain Cylindrical Grinder. No. 11 B&S centers, 24 work speeds, 12 table speeds. 2"x17" grinding wheel. With 8 steady rests, 6 leveling blocks, center grinding attachment, pump, tank and piping, and motor controls. Main drive 20 H.P., 230 V D.C. motor. Headstock motor 1½ H.P., D.C. A-1 condition. Immediate delivery.
BORING MILL, 24" Bullard, "New Era", M.D.
BORING MILL, 72" Niles, 2 heads, R.P.T. M.D.
BUFFERS, Gardner 4 H.P. 230 volts D.C.
DRILL, 6 spindle Moline Heavy Hole Hog
DRILLS, 513 & 416 Baker, No. 6 M.T., M.D.
DRILL, Radial, 5' American, Plain T.A., M.D.
DRILL, Radial, 6' Niles Universal, M.D.
GEAR CUTTER, spur 40" G & E, S.P.D.
GEAR PLANER, bevel 54" Gleason, M.D.
GRINDER, vert. disc No. 29-53" Besley
GRINDER, vert. surface Springfield 75"x15"
GRINDERS, vert. surface P & W, 84"x18", 48"x18", and 40"x12", S.P.D.
GRINDERS, plain cylindrical 6"x32" Norton
HAMMERS, steam forging 1100 lb. N-B-P
MILLER, univ. No. 1-B Milwaukee, S.P.D.
MILLER, vert. plain 2½-B Milwaukee, M.D.
OUTBOARD SUPPORT, 5½" bar Horiz. Mill
PLANER, 24"x24"x8' Powell, 1 Head, M.D.
PRESS, toggle No. 3 Bliss, 50 tons
SHEAR, squar. 44"x3/16" American, M.D.
SLOTTER, portable 48" Morton, M.D.
STRAIGHTENER, tube Torrington, ⅝" O.D.
STRAIGHTENER, plate H&J 84"x¾" hot
STRAIGHTENER, Newbold 48" x 16 gauge
STRAIGHTENER, #1 5 Roll Sutton, ⅜" to 1½" bars, ⅜" to 2" tubes, M.D.
SWAGING MACHINES, rotary 3-A Standard
TURRET LATHE, 34" Gisholt, H.S. 4¼"
TURRET LATHE, 3-A W&S, H.S. 3 11/16", M.D.

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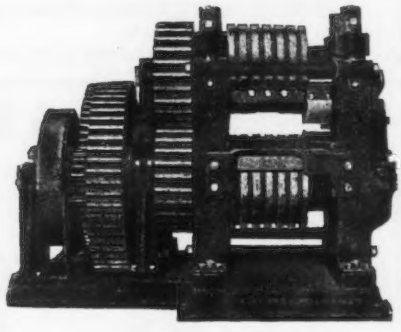
FORGING ROLLS

One of our many items



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1—No. 1A Ajax Taper
1—No. 1½A Ajax

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FOR SALE

96" Niles-Bement-Pond Vertical Boring Mill, M.D.
Potter & Johnston No. 6A Model No. 2 Chucking Machines
Barrel 3¾" Bar Horizontal Boring Mill, M.D.

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AUTOMATICS

4 spindle 7/8" Cleveland Model M, m.d.
No. 6D Potter & Johnston, m.d., Timken Bearings, for brake drum work
Nos. 22, 23, 33 New Britain, m.d.
2¼" Gridley, m.d.
2¼" Cleveland Model A, m.d.
2½ Cleveland Model A, m.d.
3¼" Gridley, m.d.
4¼" Cleveland Model A, m.d.
6" Cleveland Model A, m.d.

AIR COMPRESSORS

Usaco, m.d., with 5 H.P. motor and tank
6x6" Curtis Twin Cylinder
U. S. Air Compressor with motor and tank
Air Hoists, 7" dia. cylinder

ARBOR PRESSES

15 ton Lucas High Pattern
No. 4 Greenerd
Barnes Screw Press, 20" between strain bars
King Screw Press, 36" between bars, belt

BOLT THREADING MACHINES

¾" Economy Style R, with Lanco Head
No. 11-S Rickert-Shafer Automatic Threading, m.d., cap. 3/8" to 1" rods
American Bolt Heading Machine, 1¼" cap.

VERTICAL BORING MILLS

72" King Heavy Duty, right hand swivel turret, left hand swivel ram, right hand side head, plain table, constant speed m.d., 4 face plate jaws. Latest type, practically new
42" Colburn Heavy Duty, 2 swivel heads, 3 jaw combination chuck table, constant speed motor drive
48" Cincinnati Rapid Production, 1 turret and 1 swivel head on cross rail, plain table, constant speed motor drive, late type
42" Niles-Bement-Pond Car Wheel Borer, belt
10' extended to 16' Betts, with two swivel heads on rail, motor drive, with 2 A. C. motors
34" Colburn, 15 hole turret head on rail, motorized
52" Niles, 2 heads, motorized
56" Niles, 2 heads, motorized

HORIZONTAL BORING MILLS

3½" bar Rochester Horizontal, m.d.
No. 0 Fosdick, 3" bar, m.d.
No. 31 Lucas, 3" bar, extra column height, revolving table, m.d.
No. 1 BE Bloomquist & Eck, 3¼" bar, m.d.
4" double spindle Barrett, m.d., size of bed plate 72" wide by 13'10" long, has facing attach.
2¾" bar Sargent Floor Type, size of floor plate 16' long by 4' wide
4" bar Niles Horizontal Table Type, m.d.
4½" bar Niles, m.d.
5½" bar Niles, m.d., circular table, screw cutting attach.

BROACHING MACHINES

No. 4L LaPointe Hydraulic, m.d., latest type
NEW Cincinnati Mill Broach, 10" spindle, m.d.
No. 2 LaPointe, belt
No. 2 LaPointe of Hudson, belt
No. 3 J. N. LaPointe Double, belt

HIGH SPEED BALL BEARING DRILLS

Allen Bench Type, No. 1 Taper, m.d.
Automatic Sensitive, m.d., ¼" cap.
No. 1 Avey Bench Type, No. 2 Taper, m.d.
No. ½ Avey Bench Type, plug taper, m.d.
14" Canedy-Otto, m.d.
Delta Floor Type, No. 2 Taper
No. 5M-16" Fosdick, m.d. on spindle, No. 3 Taper
Providence Eng. Co. Model K, m.d., No. 2 Taper
Providence Eng. Co. Model E, m.d.
Sipp Q.C., m.d., No. 2 Taper
Taylor & Fenn, No. 2 Taper, belt
1 spindle Allen, belt
Henry & Wright Class K, belt, No. 2 Taper
Sigourney, belt
2 spindle Sigourney, belt, No. 1 Taper
3 spindle Barr, No. 1 Taper, belt
4 spindle No. 2 Fosdick, belt, p.f., No. 2 Taper
4 spindle Gardam, belt, No. 1 Taper
4 spindle Henry & Wright Class B, No. 2 Taper
4 spindle Kokomo Superior, belt, No. 3 Taper
6 spindle No. 3 Avey, m.d., No. 3 Taper, 12" overhang

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AUTOMATICS

14"x19" Fay automatic lathe
1" Cleveland Model J double end
1⅛", No. 55 National Acme with tapping attachment
1½" New Britain 6 spindle
4½" Gridley Model H chucker
7" Baird 6 spindle chucker
No. 16 Gisholt Simplimatics

BROACHES

2 ton American vertical hydraulic
No. 3 Lapointe double screw type
No. 4 Lapointe screw type

COMPRESSORS

427' Chicago tandem steam
550' National, electric drive
1400' Sullivan, electric drive

DRILLS

16", Edlund, 1, 2 & 4 spindle sens.
15" Avey No. 2B sensitive
21" Cincinnati; Bickford Mfg.
Nos. 15½, 15½D & 15½F Foote Burt
Nos. 11, 12 & 13 Natco multiple
No. 430 Barnes double end
Kingsbury & Edlund unit heads

GEAR MACHINERY

No. 16HS Gould & Eberhardt hobbers
10", No. 1 Lees Bradner hobbers
Type ZI Fellows gear shaper
24"x12" Fiather auto. spur.
26"x 8" Brown & Sharpe auto. spur
36"x 6" Gould & Eberhardt auto. spur
48"x10" Brown & Sharpe auto. spur
15" Gleason spiral bevel pinion roughers
15" Gleason spiral bevel gear roughers
18" Gleason bevel testers & lappers
Lipe 2 spindle chamferer
Ingle tooth rounder
Model B National gear cutter checker

GRINDERS

12"x36" Landis
12"x48" No. 3 Cincinnati universal
16x36 & 16"x52" Landis
24" No. 84 Gardner opposed-disc grinder
Nos. 50 & 60 Heald cylinder or internal
No. 41 Oliver 1¾" drill grinder
No. 72 Heald electric indicator automatic internal
16"x50" Safety Emery surface

LATHES

8" Sundstrand Stub
1"x18" Pratt & Whitney automatic
3½" & 4"x36" La Swing
9"x14" Porter Cable
13"x6' Automatic threading
Melling crankshaft lathe
18"x 8' Greaves Klusman
36"x18' Putnam geared head

LATHES, TURRET

No. 2 Pratt & Whitney
21" Gisholt, 3½" hole
22" Libby, 4⅛" hole
26" Libby, 4½" hole
26" Libby, 7⅛" hole
28", No. 3B Fester, 5⅛" hole

MILLERS

No. 3 Van Norman duplex, vert. attmt.
Type C Hall planetary
Types 10 & 45 Productomatic
No. 1 Davis & Thompson duplex
No. 3 Turnmillers
48" Oesterlein tilted offset
3⅞" bar Beeman & Smith Boring Mill
3" Universal horiz. boring mill
40" Bullard vert. boring mill

PLANERS

24"x24"x5' Gray
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2— 625	G.E.	MPC	500	130
1— 600	G.E.	MPC	600	650/900
1— 850	G.E.	MPC	230	450
3— 300	G.E.	DMC	230	400/600
1— 300	G.E.	MPC	230	275/550
1— 270	Whse.		500	250/400
1— 250	Al. Ch.		230	525
2— 200	Whse.		230	400
1— 175	Whse.	SK	250	150/525
1— 150	G.E.	RC-19A	230	800/1000
1— 150	Whse.	SK-201	230	300/900
1— 150	G.E.	MPC	230	250/450
3— 120	Whse.	SK-180	230	720
3— 100	G.E.	LC-50	230	1200
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(1)	3	Euclid	30'0"	220/440-VAC.	Fl. or Cg. Op.
(1)	5	Euclid	30'11"	220-VAC.	Fl. Op.
(1)	5	P & H	54'1¼"	230-VDC.	Cg. Op.
(1)	10	Erie	80'0"	220-VAC.	Cg. Op.

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(1)—Hayward Electric Bucket, ¾-yd. cap., 220/440-V., 3-PH., 60-CY.
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ELECTRIC MONORAIL HOISTS

	Tons	Make	Current	Motors	Remarks
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(2)	1	Euclid	115/230-VDC.	1	Var. Speed
(1)	1	Cleveland Tram.	230-VDC.	2	Fl. or Cg. Op.
(1)	2	Shepard	230-VDC	1	Var. Speed
(1)	2	Shepard	230-VDC	2	Var. Speed
(1)	5	Detroit	230-VDC.	1	V.S. Geared Trolley
(1)	5	Euclid	220-VAC.	2	V.S. Fl. Op.

(2)—1-ton Shepard Hoists arranged for stationary mounting 7½-HP. motor, 220/440-VAC. Var. Speed, separate controller, cap. 32-ft. of cable, suitable for use as winches, car puller, to operate furnace doors or elevator.

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	H.P.	Make	Type	R.P.M.
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(1)	2	Shaw	B. E.	930
(1)	2	G. E.	C.O.-1803	900
(1)	2½	Star	S.D.-34	1500
(2)	2½	G. E.	C.O.-2503	725
(1)	2½	G. E.	C.O.-1803 (C.P.)	650
(1)	2½	Reliance	T	1600
(1)	3	G. E.	C.O.-1803	750
(3)	3	Shaw	C. E.	750
(1)	5½	G. E.	C.O.-1804	725
(1)	6	G. E.	C.O.-1805	1150
(1)	10	G. E.	C.O.-1805	925
(2)	10	Westgshe.	K-4	750
(1)	7/10	G.E.	M.D.-102	1025/800
(1)	19	C. W.	B. W.	560
(1) (NEW)	20/25	Westgshe.	K-5	975/875
(2)	20/30	G. E.	M.D.-104 (C.P.)	725/575
(6)	25	G. E.	C.O.-1809	850
(2)	30/45	G. E.	M.D.-104½ (C.P.)	625/500
(1)	50	G. E.	C.O.-1810	725
(2)	65/85	G. E.	C.O.-1830	700/650
(1)	65/85	G. E.	C.O.-1811	650/550

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CARS — CRANES — COMPRESSORS
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SHOVELS — TRACTORS — ETC.

WE WELCOME YOUR INQUIRIES

WE WILL FIGURE WITH YOU ON YOUR SURPLUS

B. M. WEISS CO.
Girard Trust Bldg. Phila. 2, Pa.

Mr. Operating Man: ***Mr. Traffic Man:***

Your own owned CARS!
Demurrage, Avoidable Labor Expense, Extra
What could you SAVE?
What increase in Production could you EFFECT?
Consider also, benefits from MOBILE "storage"!
Which of these cars could you use?

125, Hopper, Double, 50-Ton
40, Hopper, Side-Discharge, 50-Ton
10, Koppel, Side-Discharge, 24-Yd., 30-Ton
150, Refrigerator, 40-Ft, 40-Ton
16, Refrigerator, 36-Ft., 30-Ton
19, Ballast, Composite 50-Ton
25, Box, 36-Ft., 40-Ton; Steel Ends
2, Dump, Western, Automatic, 20-Yd., 40-Ton
10, Dump, K & J Automatic, 16-Yd., 40-Ton
5, Flat, 40-Ft., 40-Ton
43, Gondola, Composite, 36-Ft. & 40-Ft., 40-Ton
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All cars are priced to sell!

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LOCOMOTIVE & CATERPILLAR CRANES

40 ton BROWNING Loco. Crane
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90 Tons No. 12 Gauge Sheets Approximately 6 ft. by 9 ft.
700 Pieces 7" Channels, 8'0
35 Tons ⅞" Tank Plate, 5'0 by 11'6

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167 bars 5½" round steel bars, hot rolled heat treated turned and polished with dia., tolerance of plus .000" minus .006" in dia., in lengths of 9'7" to 13'4". Can furnish complete analysis. Can quote bargain price. Must be moved at once.

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VERMONT MARBLE COMPANY
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We can furnish plain or raised face, slip-on or screwed.

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2—43" C. H. rewound
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1—STEEL BUILDING 40 Ft. by 600 Ft. by 18 Ft. high
25—4'-0 Built up Girders 39'0 long
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FOR SALE AT BARGAIN PRICES

45,000# 1¼x 1 x⅛ Angles 60'
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40,000# ¾x ¾ x⅛ Tees 25'
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FOR SALE

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1—25-TON 4-WHEEL DAVENPORT SADDLE TANK LOCOMOTIVE. 56½" GAUGE. CODE BOILER. TRACTIVE EFFORT 10,400 LBS. COMPLETELY OVERHAULED.

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MORE FOR YOUR DOLLAR
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"*ANYTHING* containing IRON or STEEL"
TRY US WHEN OTHERS FAIL!
OUR "LINE"

CARS: freight industrial, etc.
CAR REPAIR PARTS;
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ABANDONED PLANTS, MACHINERY & EQUIPMENT
SCRAP-IRON; plain, nickel, tungsten, etc.

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39 years' experience
13496 S. Brainard Ave., Chicago 33, Illinois
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SPECIAL 100—All Steel 50 TON Hoppers

35—40 ton steel u/f flats.
20—50 ton steel u/f flats.
15—30 ft. all-steel Gons. A1 condition.
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25—50 ton all-steel Gons.
25—30 ton steel Gons., St. Ga. Blt. 1928.

LOCOMOTIVE CRANES
Saddle Tank Locomotives

RAILS
Complete Stocks at 90# 85# 75# 70# 65# 60# and lighter weights, with angle bars, carried at principal points throughout the country, available for rail or water shipment.

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RAILWAY EQUIPMENT
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FOR SALE
Manganese Steel Plates
Spec. N.E. 1345
1100 pcs. (636 net ton) 28" x 1-5/16" x 110". Mill Price $3.92 cwt.
Inspection invited—All offers will be considered.
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Hammond, Indiana
Phone—Pullman 4400 Extension—358

ALLOY STEEL SCRAP CONSUMERS!
We are one of the largest handlers of it!
LOCATION NO HANDICAP!
Perhaps we can furnish the identical scrap for any specifications you require?
If so, consider increased Production and Profit this returns!
Specializing and Experienced!
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TRACK ACCESSORIES
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• PROMPT SHIPMENTS
• FABRICATING FACILITIES
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EVERYTHING FROM ONE SOURCE
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NEW-USED-UNTESTED
2nd Ave. 50th-51st St. *est. 1904* Brooklyn, N.Y.

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Also in stock—New & Used
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New RAILS Relayers
All sizes and weights. Also frogs, switches, spikes, bolts, tie plates, contractors' and mine equipment carried in stock.
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M. K. FRANK
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New York, N. Y. • Carnegie, Pa.
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WANTED

COLD & HOT ROLLED ROUND STEEL BARS
COLD ROLLED — 1500' 1¼" — 400' 1⅜" —400' 1⅝". Also offers other sizes.
HOT ROLLED MILD STEEL — (40) 25' lengths 6½" Diam. Random lengths 2" —2½"—3½"—4". Also offers various other sizes.
MERRICKVILLE ENGINEERING CO. LIMITED
MERRICKVILLE, ONTARIO, CANADA

WANTED
1 Squaring Shear 8 ft., capacity ½".
1 Steel Brake for ½" plate.
State condition, manufacture, etc.
THE ATLAS IRON & STEEL CO.
1522 to 30 N. Delaware Ave., Phila., Pa.

WANTED TO BUY
2 Welded Fuel Oil Storage Tanks—60,000 to 80,000 Barrel Capacity. Give Full Details of Price and Construction.
ADDRESS BOX B-344
Care *The Iron Age*, 100 E. 42nd St., New York 17

WANTED
10-K.W. Generator
220-Volt DC, 475 RPM
for lifting-magnet
BROWN-STRAUSS CORPORATION
Box 78 Kansas City 10, Mo.

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"*ANYTHING* containing IRON or STEEL"
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WANTED
No. 8 Standard Machine Co.'s Auburn, R. I., Rolling Mill.
½"x 6' Squaring Shear.
½"x12' Bending Rolls.
D. E. DONY MACHINERY CO.
47 LAURELTON ROAD, ROCHESTER 9, N. Y.

WANTED
Overhead traveling electric bridge crane
Double trolley, five tons hoisting capacity each, bridge travel 300' per minute or faster, span 75'0", hoist speed minimum 40' per minute, 250 Volt D. C. P & H make preferred.
W. J. HOLLIDAY & CO.
INDIANAPOLIS 7, INDIANA

When you are in the market for something that's hard to locate, advertise for it here. It's a quick and almost sure way to find what you want.

BUSINESS OPPORTUNITIES

KYANITE

Available for post-war development. A large deposit of kyanite bearing ore assaying 35% kyanite. Economy of quarrying and simplicity of concentrating make it one of the most valuable deposits in America. Property is on good highway, near railroad and accessible to markets.

ADDRESS BOX B-338
Care *The Iron Age*, 100 E. 42nd St., New York 17

NEW INVENTIONS WANTED

Mechanical and electrical devices for post-war manufacture and sale. Either new ideas, or improvements upon present methods.

P. O. Box 217, Denville, N. J.

Owner of non-ferrous foundry, 100% War Production, with postwar contracts, offers fine opportunity to industrious A-1 foundryman with capital to invest in ½ interest in $300,000 per year concern in lively community. Building owned by Operator with room for expansion. First class references required.

ADDRESS BOX 7747-A
Care *The Iron Age*, 1134 Otis Bldg., Chicago 3

EMPLOYMENT EXCHANGE

EMPLOYMENT SERVICE

AD LEONARD
Is Looking for:

VICE-PRESIDENT—$20,000. Under 45. M. E. or structural engineering grad. Experience manufacturing large machinery, heavy equipment.

SALES EXECUTIVE—$15,000-$18,000. Under 50. Experience on handling dealer organizations on National basis, merchandising, contracting arrangements.

FACTORY MANAGER—$15,000. Under 50. High precision experience with automatic machinery.

EXECUTIVE DESIGN ENGINEER—$8,000-$10,000. Under 50. Charge of design for production. For purpose adapting corporation's products for economical manufacture.

DESIGN ENGINEER—$7,500. Under 40. M. E. graduate. Broad engineering background in refrigeration and Master's degree in heat transfer engineering.

LABORATORY SUPERVISOR—$7,000. Under 45. To supervise Research and Development Laboratories. Plan test work and test techniques. Engineering degree specializing in air conditioning and heat flow. Definite interest in instrumentation, measurement methods, laboratory equipment.

PROJECT ENGINEER—$7,500. Under 45. Actual experience design of fractional horsepower F-12 hermetic motor compressor units and related equipment.

SOUND VIBRATION SPECIALIST—$5,000. Under 40. Experience in fields of instrumentation involving electronic circuits. Prefer physicist or electrical engineer.

ASSISTANT SALES MANAGER—$5,000. Under 45. C. E. degree. At least ten years' experience in sale of industrial chemicals.

SALES ENGINEER—$6,000-$8,000. Under 45. Refrigeration experience.

PERSONNEL ADVANCEMENT BUREAU
Executives Exclusively
Write AD LEONARD, Pres.
Grant Bldg. — Pittsburgh, Pa.

EXECUTIVES AND TECHNICAL MEN
Be Ready for Post War Opportunities

We solicit inquiries from qualified candidates who desire to contact employers for positions paying up to $20,000 per year. Confidential. Est. 29 years.

(Inquiries from Employers entail no obligation)

THE NATIONAL BUSINESS BOURSE
20 W. Jackson Blvd., Chicago 4

SALARIED POSITIONS — This advertising service of 34 years' recognized standing negotiates for high salaried supervisory, technical and executive position. Procedure will be individualized to your personal requirements and will not conflict with Manpower Commission. Retaining fee protected by refund provision. Identity covered and present position protected. Send for details R. W. BIXBY, Inc., 274 Delward Bldg., Buffalo 2, N. Y.

HELP WANTED

MAJOR OIL COMPANY WANTS man with personnel and industrial relations experience for permanent position of Supervisory Training Conference Leader in Midwest. State age, experience, education, draft status. Those in essential industry need not apply. Availability certificate required. Address Box B-334, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

WANTED — WORKS MANAGER

Prominent manufacturing concern in New York City, employing about 650 people, whose products (metal specialties) are universally known and used, is looking for an executive with engineering training and manufacturing experience to supervise all production departments. Knowledge of cold heading, cut and roll threading, automatic second operation machines for small precision parts, highly desirable but not essential. This is an unusual opportunity for a man having the proper qualifications to make a permanent connection with a firm now producing for the war effort the same items that it makes in peace time. Replies should contain full particulars including complete record of positions held during past ten years. All communications will be held strictly confidential and no references will be approached without applicant's permission. Statement of availability required.

ADDRESS BOX B-336
Care *The Iron Age*, 100 E. 42nd St., New York 17

ENGINEER DESIGNER
ON HYDRAULIC PRESSES
with extensive experience on
Oilhydraulic Presses and Machinery
Good salary assured for right man
Statement of availability required.
WRITE BOX B-353
Care *The Iron Age*, 100 E. 42nd St., New York 17

DIVISION FOREMAN

For department producing riveted and welded aluminum aircraft parts. Salary $5000.00 plus bonus. Statement of availability required.

ADDRESS BOX B-340
Care *The Iron Age*, 100 E. 42nd St., New York 17

WELDING ENGINEER
WANTED FOR INLAND SHIPYARD
IN NORTH ALABAMA

Must be experienced in welding technique and procedure, have knowledge both practical and technical of welded construction and capable of handling men. Give full qualifications, salary expected and references in first letter. Write H. A. Swanzey, c/o Ingalls Shipbuilding Corporation, Birmingham, Alabama. Do not apply if now engaged in war work.

METALLURGIST. For the control of acceptance of alloy steels and heat treating processes, in a progressive, long established mid-west manufacturing concern having a diversified line of postwar importance. At least a four year college training and two to five years' experience required. Preference will be given to men under 30 years of age whose record shows ability to merit rapid advancement. Statement of availability required. Address Box B-309, care *The Iron Age*, 100 E. 42nd St., New York 17.

EXPERIENCED SALESMAN — for steel warehouse to cover metropolitan area—must be a live wire. State past experience, references, availability and draft status. Straight salary basis. Address Box B-348, care *The Iron Age*, 100 E. 42nd St., New York 17.

HELP WANTED

WANTED

GRADUATE METALLURGICAL ENGINEER

. . . with 5 to 7 years' experience in electric cast steel foundry. Experience in research work also desirable. Permanent position offered by a long-established AAA-1 company, manufacturing steel castings chiefly for the petroleum and process industries. Location in southwestern city where ample housing facilities exist.

If you feel qualified for this key position in an expanding organization, apply giving full information and enclosing small photograph. Replies will be held strictly confidential. Statement of availability required. Maximum salary — $5000 per year.

ADDRESS BOX B-323
Care *The Iron Age*, 100 E. 42nd St., New York 17

PRODUCTION MANAGER

Wanted by old established progressive company, with modern plant, building high grade machinery.

Business now on war work but builds nationally known products in normal times.

This is a permanent position for the right man, with opportunities for advancement according to accomplishments.

Give details as to experience, age, and salary expected. Correspondence confidential.

ADDRESS BOX B-341
Care *The Iron Age*, 100 E. 42nd St., New York 17

INDUSTRIAL FURNACE DESIGNER — Position open for experienced furnace designer, preferably but not necessarily, with electric furnace experience. Experience on mechanical handling and quenching equipment of particular value. Situation should interest one looking ahead to postwar prospects. Generous pension plan. All details: education, experience, availability, salary and photograph first letter. Ajax Electric Co., Inc., Frankford Ave. at Delaware Ave., Phila. 23, Pa.

WANTED: Man for Detroit District Office territory by important manufacturer of welded and seamless steel and alloy tubing. Applicants should have steel sales experience. Apply, giving full particulars. Statement of availability required. Address Box B-354, care *The Iron Age*, 100 E. 42nd St., New York 17.

EMPLOYMENT EXCHANGE

HELP WANTED

SALES EXECUTIVE:—A new sales organization needs several men with sales and executive ability. Experience in the machinery and equipment line as well as an intense interest in general sales would be advantageous. Must be able to assume executive responsibility. Write complete qualifications and personal particulars of interest. Statement of availability necessary. Address Box B-333, care *The Iron Age*, 100 E. 42nd St., New York 17.

WANTED: — Market Research Editor for a new machinery and equipment service publication. Prefer an aggressive young married man interested in a growing future. Should be a keen student of marketing problems and trends. Must have contacts for statistical information. Write complete details of qualifications and desires. Statement of availability required. Address Box B-332, care *The Iron Age*, 100 E. 42nd St., New York 17.

PLANT SUPERINTENDENT, for long established Steel Wire Mill—to assume complete charge Production, Maintenance of equipment and Buildings. State in detail qualifications, experience, availability, etc. Address Box B-337, care *The Iron Age*, 100 E. 42nd St., New York 17.

REPRESENTATIVES WANTED

WAR AND POST-WAR REPRESENTATION

New AAA industrial specialty currently used by metal and general industry, of greatest war and post-war potentiality. Has open territories: Columbus, Cleveland, Toledo, Louisville, St. Louis, Saginaw, Lansing, Battle Creek, Dallas, North and South Dakota, New Mexico, Mississippi, Arkansas and various provinces in Canada. Attractive commission rates. Efficient and introduced men can build up excellent following. Technical background desirable. Free instructions and training given by company. Large users already in open territories. Describe past activity; submit small photograph, not returnable.

Statement of availability required.

ADDRESS BOX B-335
Care *The Iron Age*, 100 E. 42nd St., New York 17

WANTED—ESTABLISHED SALES REPRESENTATIVE that can handle additional lines, by well-known firm that engineer and produce all types of heat treating and non-ferrous melting furnaces; should have a knowledge of heat treating and equipment. Representatives are desired in New England, New York, Philadelphia, Pittsburgh, Cleveland, Cincinnati, Chicago and St. Louis territory. Address Box B-342, care *The Iron Age*, 100 E. 42nd St., New York 17.

ACCOUNTS WANTED

SALES ENGINEERS

Licensed Professional Engineers, rated Dun & Bradstreet, and maintaining well located New York City offices, offer manufacturer outstanding opportunity for representation in Eastern Territory. We are eminently qualified to handle special mechanical items which require engineering knowledge. Will consider only substantial, well-rated concerns. Remuneration based entirely on performance.

EDWARD W. WEILER, ENGINEERS
724 Fifth Avenue, New York 19, N. Y.

ACCOUNTS WANTED

SALES REPRESENTATION STEEL, MINE AND MANUFACTURING INDUSTRIES BY ACTIVE AND SUCCESSFUL ORGANIZATION PITTSBURGH TERRITORY

ADDRESS BOX A-775
Care *The Iron Age*, 428 Park Bldg., Pittsburgh 22

ESTABLISHED WASHINGTON, D. C., ENGINEERS, SPECIALIZING IN FINDING NEW LOCATIONS, MARKETS, METHODS, OUTLETS; MAKING ANALYSES; GETTING THINGS DONE; REPRESENTING NUMEROUS CHAMBERS OF COMMERCE, ASSOCIATIONS, INDUSTRIALS; ENJOYING SUCCESS AND RECOGNITION, GOOD OFFICES, ALL FACILITIES AND SUBSTANTIAL BACKGROUND, SEEK NON-COMPETITIVE ACCOUNT. ADDRESS BOX B-339, CARE *THE IRON AGE*, 100 E. 42ND ST., NEW YORK 17.

POSTWAR PLANNERS

Sales Engineer with foundry, forging, gear, die casting and complete machining experience can take on one more line for sale to industrial plants. Cleveland office established for 25 years. Territory: Ohio, Northwestern Penn. and Western New York.

ADDRESS BOX C-1101
Care *The Iron Age*, 1016 Guardian Bldg., Cleveland 14

NEW SALES PARTNERSHIP IN CHICAGO AREA invites correspondence from manufacturers for war and postwar representation. Excellent shop and office contacts. Well versed in all metal lines, especially steel, wire, rods, bars, strip, sheets, tubes, welding rods, wire cloth, wire rope, springs, castings, forgings, and kindred lines including fabricated products. Also non ferrous. Will limit activities to not more than three accounts and guarantee complete and adequate coverage. Address Box No. 7746-A, *The Iron Age*, 1134 Otis Bldg., Chicago 3.

SITUATIONS WANTED

PLANT OPERATING EXECUTIVE: trained in: management, engineering, metallurgy. 15 years in charge of plants; precision machine and metal products. All-around mechanic and organizer. Ability to lead and handle people harmoniously, plus mechanical judgment. Wants heavy assignment and responsibility; 3 to 600 employees. Control costs, production, gets things done with ordinary people, deliver results. Age, 46: Protestant. Address Box B-352, care *The Iron Age*, 100 E. 42nd St., New York 17.

SITUATIONS WANTED

PRODUCTION EXECUTIVE WORKS MANAGER

Desires to contact firms requiring the services of an executive.

Experience: Have successfully filled positions as chief engineer, production manager, plant and works manager, in structural fabrication, general machining, equipment and metal products manufacture. Thorough knowledge of tooling methods, production planning, schedules, labor relations and can assume full management responsibilities.

Personal: Under 45, graduate mechanical engineer, married, U. S. citizen, proven successful record, never unemployed, go anywhere but prefer south.

Requirements: Job must have excellent post war opportunities, salary to exceed $15,000.

ADDRESS BOX B-347
Care *The Iron Age*, 100 E. 42nd St., New York 17

WELDING ENGINEER: Desires to locate with an organization which has the facilities to employ a young man with the following experience and qualifications. 1. Six years of welding engineering experience on most all types of welding. Types of work includes, gun mounts, armorplate, ship sub assemblies, diesel engine parts, pressure vessels, non-ferrous tanks and special structural work. 2. Qualified to operate and supervise x-ray and gamma-ray equipment under the codes and requirements of the various government specifications. 3. Experienced in designing jigs and fixtures for production fabricating. A good knowledge of cost analysis, estimating and time study work. 4. Extensive work in applying automatic welding for special applications. Experience with resistance welding and other allied welding processes. 5. A technical education in mechanical engineering. A member of the American Welding Society. 6. A practical knowledge of metallurgy, heat treatment and physical testing equipment. Particularly interested in experimental development and designing of products for welding. Address Box B-343, care *The Iron Age*, 100 E. 42nd St., New York 17.

GENERAL MANAGER: Invites correspondence with owner of medium-size machinery, tool, foundry or related business requiring mature, reliable directing ability in management, sales, finance and other creative activities that produces results. Experience covers all positions from Accountant to Secretary-Treasurer including fifteen years as General Manager. Ability to develop efficient organization and build up sales, production and net returns assured by previous record. Address Box B-346, care *The Iron Age*, 100 E. 42nd St., New York 17.

MANAGEMENT ENGINEER available due to sale of business. Broad experience business administration, costs, production, methods, new products. Married. University graduate. $10,000. Address Box B-325, care *The Iron Age*, 100 E. 42nd St., New York 17.

SALES EXECUTIVE. Capable Salesman, Engineer, Organizer; 15 years as Machine Tool Salesman, Dealer, Plant Manager. Can get results. Address Box B-313, care *The Iron Age*, 100 E. 42nd St., New York 17.

LIGHT METALS—CONSULTING METALLURGICAL ENGINEER, WITH LONG EXPERIENCE IN MAGNESIUM AND ALUMINUM, WILL SHORTLY RESUME PRIVATE PRACTICE. FULL OR PART TIME. ENGAGEMENTS SOLICITED. Address Box B-351, care *The Iron Age*, 100 E. 42nd St., New York 17.

NOTICE TO "HELP WANTED" ADVERTISERS

A regulation by the War Manpower Commission requires that all "Help Wanted" advertisements must include the following:

"Statement of availability required"

THE IRON AGE

100 East 42nd Street **New York 17, N. Y.**

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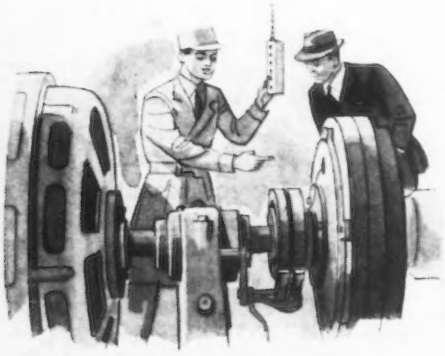

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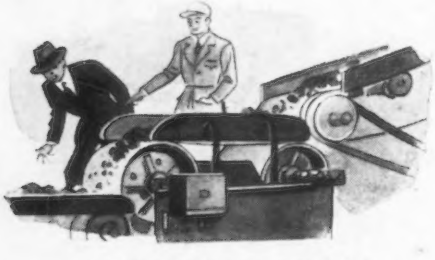

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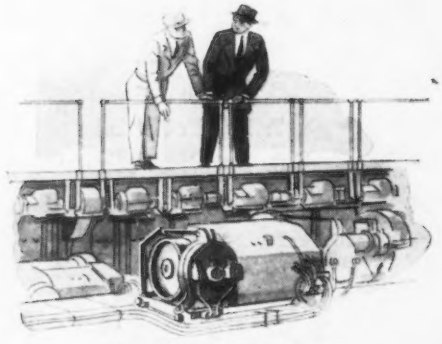

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